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A VACATION TOUR.

LONDON

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THE WEISSHORN FROM THE RIFFEL.

MOUNTAINEERING

IN

1861.

A VACATION TOUR.

BY JOHN TYNDALL, F.R.S.

PROFESSOR OF NATURAL PHILOSOPHY IN THE ROYAL INSTITUTION OF GREAT BRITAIN:
AUTHOR OF 'THE GLACIERS OF THE ALPS.'

LONDON:
LONGMAN, GREEN, LONGMAN, AND ROBERTS.
1862.

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PREFACE.

FOR the drawing of the Weisshorn, from which the frontispiece is taken, I am indebted to the obliging kindness of Mr. Wm. Mathews, Jun., of the Alpine Club. As the reader looks at the engraving, the ridge along which we ascended is to his right hand.

For the sketch of the Matterhorn, I have to thank my friend Mr. E. W. Cooke. It represents this 'paragon of mountains as to form,' in its sharpest aspect.

The mottoes taken from Mr. Tennyson will be recognised by everybody: — the others are from the poems of Mr. Emerson.

The writing of this little book has been a pleasure to me; constituting, as it often did, a needed relaxation from severer duties. Both as regards the past

and the future,—as objects of memory and of hope,—the Alps are of interest to me. Among them I annually renew my lease of life, and restore the balance between mind and body which the purely intellectual discipline of London is calculated to destroy. I can wish my reader no better possession than a full measure of that health and strength which his summer exercises confer upon the mountaineer.

J. T.

Royal Institution:
March 1862.

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View of the Weisshorn from the Riffel, from a drawing by Elijah Walton, belonging to Mr. W. Mathews, jun. *Frontispiece*

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MOUNTAINEERING IN 1861

A VACATION TOUR

(ADDRESSED TO X.)

CHAPTER I.

LONDON TO MEYRINGEN

'The mountain cheer, the frosty skies,
Breed purer wits, inventive eyes;
And then the moral of the place
Hints summits of heroic grace.
Men in these crags a fastness find
To fight corruption of the mind,
The insanity of towns to stem,
With simpleness for stratagem.'

HERE I am at length, my friend, far away from the smoke and roar of London, with a blue sky bending over me, and the Rhine spreading itself in glimmering sheets beneath my window. Swift and silent the flashing river runs; not a whisper it utters here, but higher up it gets entangled in the props of a bridge and breaks into foam; its compressed bubbles snap like elastic springs, and shake the air into sonorous vibrations. Thus the rude mechanical motion of the river is converted into music. From the windows of the edifices along the banks gleam a series

of reflected suns, each surrounded by a coloured glory. The hammer of the boat-builder rings on his plank, the leaves of the poplars rustle in the breeze, the watch-dog's honest bark is heard in the distance, and the current of Swiss life is poured like that of electricity in two directions across the bridge.

The scene is very tranquil; and the peace of the present is augmented by its contrast with the tumult of the past. Yesterday I travelled from Paris, and the day previous from London, when the trail of a spent storm swept across the sea and kept its anger awake. The stern of our boat went up and down, the distant craft were equally pendulous, and the usual results followed. Men's faces waxed green; roses faded from ladies' cheeks; while poor unconscious children yelled intermittently in the grasp of the demon which had taken possession of them. One rare pale maiden sat right in the line of the spray which was churned up by the paddle-wheel, and carried by the wind across the deck: she drew her shawl around her, and bore the violence of the ocean with the resignation of an angel; a white arm could be seen shining through the translucent muslin, but even against it the cruel brine beat as if it were a mere seaweed. I sat at rest, hovering fearfully on the verge of that doleful region, whose bourne most of those on board had already passed. A friend whom I accompanied betook himself early to the cabin, and there endured the tortures of the condemned. Nothing, perhaps, takes down the boasted supremacy of the human will more effectually than the smell and shiver of a steamer superposed upon

the motion of the sea. We finally reached Boulogne, and sought to reconstitute our shattered energies at the restauration. The success was but partial. The soup was poor, and the *filets* reminded one of the reindeer boots of the Laplander, which their owner gnaws when other provisions fail. To one who regards physical existence as the mystic substratum of man's moral nature, few seem more ripe for judgment than he who debases that nature by the ministration of unwholesome food. The self-same atmosphere forced through one instrument produces music; through another, noise: and thus the spirit of life, acting through the human organism, is rendered demoniac or angelic by the health or the disease which originate in what we eat.

The morning of the 1st of August finds us on our way from Paris to Bale. The heavens are unstained by cloud, and as the day advances the sunbeams grow stronger, and are drunk in with avidity by the absorbent cushions which surround us. In addition to this source of temperature, eight human beings, each burning the slow fire which we call life, are cooped within the limits of our compartment. We sleep, first singly, then by groups, and finally as a whole. Vainly we endeavour to ward off the coming lethargy. We set our thoughts on the sublime or beautiful, and try by an effort of will to hold them there. It is no use. Thought gradually slips away from its object, or the object glides out of the nerveless grasp of thought, and we are conquered by the heat. But what *is* heat that it should work such changes in moral and intellectual nature? Why should 'souls of fire' be the heirlooms of

'children of the sun'? Why are we unable to read 'Mill's Logic' or study the 'Kritik der Reinen Vernunft' with any profit in a Turkish bath? Heat, defined without reference to our sensations, is a peculiar kind of motion—motion, moreover, as strictly mechanical as the waves of the sea, or as the aërial vibrations which produce sound. The communication of this motion to the material atoms of the brain produces the moral and intellectual effects just referred to. Human action is only possible within a narrow zone of temperature. Transgress the limit on one side, and we are torpid by excess; transgress it on the other, and we are torpid by defect. The intellect is in some sense a function of temperature. Thus at 2 P. M. we wallowed in our cushions, drained of intellectual energy; six hours later, the stars were sown broadcast through space, and the mountains drew their outlines against the amber of the western sky. The mind was awake and active, and through her operations was shed that feeling of devotion which the mystery of creation ever inspires. Physically considered, however, the intellect of 2 P. M. differed from that of 8 P. M. simply in the amount of motion possessed by the molecules of the brain. You, my friend, know that it is not levity which prompts me to write thus. Matter, in relation to vital phenomena, has yet to be studied, and the command of Canute to the waves would be wisdom itself compared with any attempt to stop such inquiries. Let the tide rise, and let knowledge advance; the limits of the one are not more rigidly fixed than those of the other; and no worse infidelity could seize upon

the mind than the belief that a man's earnest search after truth should culminate in his perdition. Fear not, my friend, but rest assured that as we understand *matter* better, *mind* will become capable of nobler and of wiser things.

The sun was high in heaven as we rolled from the station on the morning of the 2nd. I was in fair health, and therefore happy. The man who has work to do in the world, who loves his work, and joyfully invests his strength in the prosecution of it, needs but health to make him happy. Sooner or later every intellectual canker disappears before earnest work. Its influence, moreover, fills a wide margin beyond the time of its actual performance. Thus, to-day, I sang as I rolled along—not with boisterous glee, but with that serene and deep-lying gladness which becomes a man of my years and of my vocation. This happiness, however, had its roots in the past, and had I not been a worker previous to my release from London, I could not now have been so glad an idler. Nature, moreover, was in a pleasant mood; indeed, in any other country than Switzerland, the valley through which we sped would have produced excitement and delight. Noble fells, proudly grouped, flanked us right and left. Cloud-like woods of pines overspread them in broad patches, with between them spaces of the tenderest green; while here and there the rushing Rhine gleamed like an animating spirit amid the meadows.

Some philosophers inculcate an independence of external things, and a reliance upon the soul alone.

But what would man be without Nature? A mere *capacity*, if such a thing be conceivable alone; potential, but not dynamic; an agent without an object. And yet how differently Nature affects different individuals! To one she is an irritant which evokes all the grandeur of the heart, while another is no more affected by her magnificence than are the beasts which perish. The one has halls and corridors within, in which to hang those images of splendour which Nature exhibits; the other has not even a chalet to offer for their reception. The countenance betrays, in some degree, the measure of endowment here. I know—*you* know—countenances, where the mind, shining through the eyes, conveys hints of inner bloom and verdure; of noble heights and deep secluded dells; of regions also unexplored and unexplorable, which in virtue of their mystery present a never-flagging charm to the mind. You, my friend, have experienced the feelings which an Alpine sunset wakes to life. You call it tender, but the tenderness resides in *you;* you speak of it as splendid, but the splendour is half your own. Creation sinks beyond the bottom of your eye, and finds its friend and interpreter in a region far behind the retina.

Hail to the Giants of the Oberland! there they stand, pyramid beyond pyramid, crest above crest. The zenith is blue, but the thick stratum of horizontal air invests the snowy peaks with a veil of translucent vapour, through which their vast and spectral outlines are clearly seen. As we roll on towards Thun this vapour thickens, while dense and rounded clouds burst heavenwards, as if let

loose from a prison behind the mountains. The heavens darken, and the scowling atmosphere is cut by the lightning in sharp-bent bars of solid light. Afterwards comes the cannonade, and then the heavy rain-pellets which rattle with fury against the carriages. Again it clears, but not wholly. Stormy cumuli swoop round the mountains, between which, however, the illuminated ridges seem to swim in the transparent air.

At Thun I find my faithful and favourite guide, Johann Benen, of Laax, in the valley of the Rhone, the strongest limb and stoutest heart of my acquaintance in the Alps.* We take the steamer to Interlaken, and while on the lake the heavens again darken, and the deck is flooded by the gushing rain. The dusky cloud-curtain is rent at intervals, and through the apertures thus formed gleams of sunlight escape, which draw themselves in parallel bars of extraordinary radiance across the lake. On reaching Interlaken,

* Benen's letter, in reply to mine, desiring to engage him, is, I think, worth inserting here.

Hochgeschätzter Herr Tyndall,

Indem ich mit Herrn Tugget (50) fünfzig Tage auf Reisen war und Heute erst nach Laax gekommen bin, habe ich Ihren werthen Brief von 22 Juni auch nur erst Heute erhalten; so dass ich denselben Ihnen auch nur Heute gleich beantworten konnte. Wo ich Ihnen mit Vergnügen melde, dass ich immerhin bereit sein werde Sie zu begleiten wann und wohin Sie nur wünschen.

Herr Tyndall! Ich mache Ihnen meine Komplimente für das gute Zutrauen zu mir und hoffe noch an der Zeit gekommen zu sein um wieder Gelegen heit zu haben Sie bestens und baldigst zu bedienen.

Mit Hochschätzung und Emphelung

Ihr Diener

Benen.

I drive to the steamer on the lake of Brientz, while my friend F. diverges to Grindelwald to seek a guide. We start at 6 P.M., with a purified atmosphere, and pass through scenes of serene beauty in the tranquil evening light. The bridge of Brientz has been carried away by the floods, the mail is intercepted, and I associate myself with a young Oxford man in a vehicle to Meyringen. The west wind has again filled the atmosphere with gloom, and after supper I spend an hour watching the lightning thrilling behind the clouds. The darkness is intense, and the intermittent glare correspondingly impressive. Now it is the east which is suddenly illuminated, now the west, now the heavens in front; now the visible light is evidently the fringe of an illuminated cloud which has caught the blaze of a discharge far down behind the mountains. Sometimes the lightning seems to burst, like a fireball, midway between the horizon and the zenith, spreading as a vast glory behind the clouds and revealing all their outlines. In front of me is a craggy summit, which indulges in intermittent shots of thunder; sharp, dry, and sudden, with scarcely an echo to soften them off.

CHAPTER II.

MEYRINGEN TO THE GRIMSEL, BY THE URBACHTHAL AND GAULI GLACIER

'Spring still makes spring in the mind
When sixty years are told,
Love wakes anew this throbbing heart,
And we are never old.
Over the winter glaciers
I see the summer glow,
And through the wild-piled snow drift
The warm rose buds below.'

OUR bivouac at Meyringen was *le Sauvage*, who discharged his duty as a host with credit to himself and with satisfaction to us. F. has arrived, and in the afternoon of the 3rd we walk up the valley. Between Meyringen and Hof, the vale of Hasli is dammed across by a transverse ridge called the Kirchet, and the rocky barrier is at one place split through, forming a deep chasm with vertical sides through which the river Aar plunges. The chasm is called the Finsteraar-schlucht, and by the ready hypothesis of an earthquake its formation has been explained. Man longs for causes, and the weaker minds, unable to restrain their hunger, often barter, for the most sorry theoretic pottage, the truth which patient inquiry would make their own. This proneness of the human mind to jump to conclusions, and thus shirk the labour of real

investigation, is a most mischievous tendency. We complain of the contempt with which practical men regard theory, and, to confound them, triumphantly exhibit the speculative achievements of master minds. But the practical man, though puzzled, remains unconvinced; and why? Simply because nine out of ten of the theories with which he is acquainted are deserving of nothing better than contempt. Our master minds built their theoretic edifices upon the rock of fact; the quantity of fact necessary to enable them to divine the *law*, being a measure of individual genius, and not a test of philosophic system. As regards the Finsteraar-schlucht, instead of jumping to an earthquake to satisfy our appetite for 'deduction,' we must look at the circumstances. The valley of Hof lies above the mound of the Kirchet; how was this flat formed? Is it not composed of the sediment of a lake? Did not the Kirchet form the dam of this lake, a stream issuing from the latter and falling over the dam? And as the sea-waves find a weak point in the cliffs against which they dash, and gradually eat their way so as to form caverns with high vertical sides, as at the Land's End, a joint or fault or some other accidental weakness determining their line of action; so surely a mountain torrent rushing for ages over the Kirchet dam would be competent to cut itself a channel. The Kirchet itself has been moulded by the ancient glacier of the Aar. When Hof was a lake, that glacier had retreated, and from it issued the stream, the stoppage of which formed the lake. The stream finally cut itself a channel deep enough to drain the lake, and left the basis

of green meadows as sediment behind; while through these meadows the stream that once overflowed their site now runs between grassy banks. Imagination is essential to the natural philosopher, but instead of indulging in off-hand theoretic guesses, he must regard the facts, discern their connection, and out of them reconstruct the world gone by.

Throughout the early part of this day the weather had been sulky, but towards evening the clouds were in many places torn asunder, revealing the blue of heaven and the direct beams of the sun. At midnight I quitted my bed to look at the weather, and found the sky spangled all over with stars. We were called at 4 A.M., an hour later than we intended, and the sight of the cloudless mountains was an inspiration to us all. At 5.30 A.M. we were off, crossing the valley of Hof, which was hugged round its margin by a light and silky mist. We ascended a spur which separated us from the Urbachthal, through which our route lay. The Aar for a time babbled in the distance, until, on turning a corner, its voice was suddenly extinguished by the louder music of the Urbach, rendered mellow and voluminous by the resonance of the chasm into which the torrent leaped. The sun was already strong, and the world on which he shone was grand and beautiful. His yellow light glimmered from the fresh green leaves; he smote with glory the boles and the plumes of the pines; soft shadows fell from shrub and rock on the emerald pastures; snow-peaks were in sight, cliffy summits also, without snow or verdure, but in many cases, buttressed by slopes of soil which bore

a shaggy growth of trees. The grass over which we passed was sown with orient pearls; to the right of us rose the bare cliffs of the Engelhörner, broken at the top into claw-shaped masses which were turned, as if in spite, against the serene heaven. Benen walked on in front, a mass of organised force, silent, but emitting at times a whistle which sounded like the piping of a lost chamois. Hark to an avalanche! In a hollow of the Engelhörner a mass of snow had found a lodgment; melted by the warm rock, its foundation was sapped, and down it came in a thundering cascade. The thick pinewoods to our right were furrowed by the tracks of these destroyers, the very wind of which, it is affirmed, tears up distant trees by the roots.

For a time our route lies through a spacious valley which now turns to the left, narrows to a gorge, and winds away amid the mountains. Along its bottom the hissing river rushes; this we cross, climb the wall of a *cul de sac*, and from its rim enjoy a glorious view. The Urbachthal has been the scene of vast glacier action; with tremendous energy the ice of other days must have been driven by its own gravity through the narrow gorge, planing and fluting and scoring the rocks. Looking at these characters crags, one's thoughts involuntarily revert to the ancient days, and from a few scattered observations we restore in idea a state of things which had disappeared from the world before the development of man. Whence this wondrous power of reconstruction? Who will take the step which shall connect the faculties of the human mind

with the physics of the human brain? Was this power locked like latent heat in ancient inorganic nature, and developed as the ages rolled? Are other and grander powers still latent in nature, which shall come to blossom in another age? Let us question fearlessly, but, having done so, let us avow frankly that at bottom we know nothing; that we are imbedded in a mystery towards the solution of which no whisper has been yet conceded to the listening intellect of man.

The world of life and beauty is now retreating, and the world of death and beauty is at hand. We are soon at the end of the Gauli glacier, from which our impetuous friend the Urbach rushes, and turn into a chalet for a draught of milk. The Senner within proved an extortioner — '*ein unverschämter Hund;*' but let him pass without casting a speck upon the brightness of our enjoyment. We work along the flank of the glacier to a point which commands a view of the cliffy barrier which it is the main object of our journey to pass. From a range of snow-peaks linked together by ridges of black rock, the Gauli glacier falls, at first steeply as snow, then more gently as ice. We scan the mountain barrier to ascertain where it ought to be attacked. No one of us has ever been here before, and the scanty scraps of information which we have received tell us that at one place only is the barrier passable. We may reach the summit at several points from this side, but all save one, we are informed, lead to the brink of intractable precipices which fall sheer to the Lauteraar glacier. We observe, discuss, and finally decide

upon a point of attack. We enter upon the glacier; black chasms yawn here and there through the superincumbent snow, but there is no real difficulty. We cross the glacier and reach the opposite slopes; our way first lies up a moraine, and afterwards through the snow; a laborious ascent brings us close to the ridge, and here we pause once more in consultation. There is a gentle indentation to our left, and a cleft in the rocks to our right; our information points decidedly to the latter, but still our attention is attracted by the former. 'Shall we try the saddle, sir? I think we shall get down;' asks Benen. 'I think so too; let us make for it,' is my reply.

The winter snows were here thickly laid against the precipitous crags; the lower part of the buttress thus formed had broken away from the upper, which still clung to the rocks, and the whole ridge was thus defended by a profound chasm, called in Switzerland a bergschrund. At some places portions of snow had fallen away from the upper slope and partially choked the schrund, closing, however, its mouth only, and on this snow we were now to seek a footing. Benen and myself were loose coming up, F. and his guide were tied together; but now F. declares that we must all be attached, as it would injure his stomach to see us try the schrund singly. We accordingly rope ourselves, and advance along the edge of the fissure to one of the places where it is partially stopped. At this place a vertical wall of snow faces us. Our leader carefully treads down the covering of the chasm; and having thus rendered it sufficiently

rigid to stand upon, he cuts a deep gap with his ice-axe in the opposing wall. Into the gap he tries to force himself, but the mass yields, and he falls back, sinking deeply in the snow of the schrund. You must bear in mind that he stands right over the fissure, which is merely bridged by the snow. I call out 'Take care!' he responds 'All right!' and returns to the charge. He hews a deeper and more ample gap; strikes his axe into the slope above him, and leaves it there; buries his hands in the yielding mass, and raising his body on his two arms, as on a pair of pillars, he lifts himself into the gap. He is thus clear of the schrund, and soon anchors his limbs in the snow above. I am speedily at his side, and we both tighten the rope as our friend F. advances. With perfect courage and a faultless head, he has but one disadvantage, and that is an excess of weight of at least two stone. In his first attempt the snow ledge breaks, and he falls back; but two men are now at the rope, the tension of which, aided by his own activity, prevents him from sinking far. By a second effort he clears the difficulty, is followed by his guide, and all four of us are now upon the slope above the chasm. Had you, unaccustomed to mountain climbing, found yourself upon such an incline, you would have deemed it odd. Its steepness was greater than that of a cathedral roof, while below us, and within a few yards of us, the slope was cut by a chasm into which it would be certain death to fall. Education enables us to regard a position of this kind almost with indifference, still the work was by no means unexciting. In this early stage of

our summer performances, it required perfect trust in our leader to keep our minds at ease. A doubt of him would have introduced moral and physical weakness amongst us all; but the feebleness of uncertainty was unfelt; we made use of all our strength, and consequently succeeded with comparative ease. We are now near the top of the saddle, separated from it, however, by a very steep piece of snow; this is soon overcome, and a cheer at the summit announces that our escape is secured.

The indentation, in fact, forms the top of a kind of chimney or cut in the rocks, which leads right down to the Lauteraar glacier. It is steep, but we know that it is feasible, and we pause contentedly upon the summit to scan the world of mountains extending beyond. The Schreckhorn particularly interests my friend F. It had been tried in successive years by Mr. A. without success, and now F. had set his heart on climbing it. The hope of doing so from this side is instantly extinguished, the precipices are so smooth and steep. Elated with our present success, I release myself from the rope and spring down the chimney, preventing the descent from quickening to an absolute fall by seizing at intervals the projecting rocks. Once an effort of this kind shakes the alpenstock from my hand; it slides along the *débris*, reaches a snow slope, shoots down it, and is caught on some shingle at the bottom of the slope. Benen wishes to get it for me, but I am instantly after it myself. Quickly skirting the snow, which, without a staff, cannot be trusted, an *arête* is reached, from which a jump lands me on the *débris:*

it yields and carries me down; passing the alpenstock I seize it, and in an instant am master of all my motions. Another snow slope is reached, down which I shoot to the rocks at the bottom, and there await the arrival of Benen. He joins me immediately; F. and his guide, however, choosing a slower mode of descent. We have diverged from the deep cut of the chimney, rough rocks are in our way; to these Benen adheres while I, hoping to make an easier descent through the funnel itself, resort to it. It is partially filled with indurated snow, but underneath this a stream rushes, and my ignorance of the thickness of the roof renders caution necessary. At one place the snow is broken quite across, and a dark tunnel, through which the stream rushes, opens immediately below me. My descent is thus cut off, and I cross the couloir to the opposite rocks, climb them, and find myself upon the summit of a ledged precipice, below which Benen halts, and watches me as I descend it. On one of the ledges my foot slips; a most melancholy whine issues from my guide, as he suddenly moves towards me to render what help he can; but the slip in no way compromises the firmness of my grasp; I reach the next ledge, and in a moment am clear of the difficulty. We drop down the mountain together, quit the rocks, and reach the ice of the glacier, where we are soon joined by F. and his companion. Turning round now we espy a herd of seven chamois on one of the distant slopes of snow. The telescope reduces them to five full-grown animals and two pretty little kids, fair and tender tenants of so wild a

habitation. Down we go along the glacier, with the sun on our backs, his beams streaming more and more obliquely against the ice. The deeper glacier pools are shaded in part by their icy banks, and through the shadowed water needles of ice are already darting: all day long the molecules had been kept asunder by the antagonistic heat; their enemy is now withdrawn, and they lock themselves together in a crystalline embrace. Through a reach of merciless shingle, which covers the lower part of the glacier, we now work our way; over green pastures; over rounded rocks; up to the Grimsel Hotel, which, uncomfortable as it is, is reached with pleasure by us all.

CHAPTER III.

THE GRIMSEL AND THE ÆGGISCHHORN

'Thou trowest
How the chemic eddies play
Pole to pole, and what they say;
And that these gray crags
Not on crags are hung,
But beads are of a rosary
On prayer and music strung.'

GRANDLY on the morning of the 5th, the sun rose over the mountains, filling earth and air with the glory of his light. This Grimsel is a weird region — a monument carved with hieroglyphics more ancient and more grand than those of Nineveh or the Nile. It is a world disinterred by the sun from a sepulchre of ice. All around are evidences of the existence and might of the glacier which once held possession of the place. All around the rocks are carved, and fluted, and polished, and scored. Here and there angular pieces of quartz, held fast by the ice, inserted their edges into the rocks and scratched them like diamonds, the scratches varying in depth and width according to the magnitude of the cutting stone. Larger masses, held similarly captive, scooped longitudinal depressions in the rocks over which they passed, while in many cases the polishing must have

been effected by the ice itself. A raindrop will wear a stone away, much more would an ice surface, squeezed into perfect contact by enormous pressure, rub away the asperities of the rocks over which for ages it was forced to slide. The rocks thus polished by the ice itself are exceedingly smooth, and so slippery that it is impossible to stand on them where their inclination is at all considerable. But what a world it must have been when the valleys were thus filled! We can restore the state of things in thought, and in doing so we submerge many a mass which now lifts its pinnacle skyward. Switzerland in those days could not be so grand as it is now. Pour ice into those valleys till they are filled, and you eliminate those contrasts of height and depth on which the grandeur of Alpine scenery depends. Instead of skiey pinnacles and deep-cut gorges we should have an icy sea dotted with dreary islands formed by the highest mountain tops.

In the afternoon I strolled up to the Siedelhorn; a mountain often climbed by tourists for the sake of the prospect it commands. This is truly fine. As I stood upon the broken summit of the mountain the sun was without a cloud; and his rays fell directly against the crown and slopes of the Galenstock at the base of which lay the glacier of the Rhone. The level sea of névé above the great ice-cascade, the fall itself, and the terminal glacier below the fall were all apparently at hand. At the base of the fall the ice, as you know, undergoes an extraordinary transformation; it reaches this place more or less amor-

phous, it quits it most beautifully laminated, the change being due to the pressure endured by the ice at the bottom of the fall. The wrinkling of the glacier here was quite visible, the dwindling of the wrinkles into bands, and the subdivision of these bands into lines which mark the edges of the laminæ of which the glacier at this place is composed. Beyond, amid the mountains at the opposite side of the Rhone valley, lies the Gries glacier, half its snow in shadow, and half illuminated by the sinking sun. Round farther to the right stand the Monte Leone and other grand masses, the grandest here being the Mischabel with its crowd of snowy cones. Jumping a gap in the mountains, we hit the stupendous cone of the Weisshorn, which slopes to meet the inclines of the Mischabel, and in the wedge of space carved out between the two, the Matterhorn lifts its terrible head. Wheeling farther in the same direction, we at length strike the mighty spurs of the Finsteraarhorn, between two of which lies the Oberaar glacier. Here is no turmoil of crevasses, no fantastic ice-pinnacles, nothing to indicate the operation of those tremendous forces by which a glacier sometimes rends its own breast, but soft and quiet it reposes under its shining coverlet of snow. The grimmest fiend of the Oberland closes the view at the head of the Lauteraar glacier; this is the Schreckhorn, whose cliffs on this side no mountaineer will ever scale. Between the Schreckhorn and Finsteraarhorn a curious group of peaks encircle a flat snow field, from which the sunbeams are flung in blazing lines. Immediately below is the Unteraar glacier, with a long black

streak upon its back, bent hither and thither, like a serpent in the act of wriggling down the valley. Beyond it and flanking it, is a range of mountains with a crest of vertical rock, hacked into indentations which suggest a resemblance to a cockscomb; and to the very root of the comb the mountains have been cut away by the ancient ice. A scene of unspeakable desolation it must have been when Europe was thus encased in frozen armour, and when even the showers of her western isles fell solid from the skies,—when glaciers teemed from the shoulders of Snowdon and Scawfell, and when Llanberis and Borrodale were ploughed by frozen shares,—when the Reeks of Magillicuddy sent down giant navigators to delve out space for the Killarney lakes, and to saw through the mountains the Gap of Dunloe. Evening comes, and we move downwards, down amid heaped boulders; down over the tufted alp; down with headlong speed over the *roches moutonnés* of the Grimsel pass, making long springs at intervals, over the polished inclines, and reaching the hospice as its bell rings its hungry inmates to their evening meal.

F. and I had arranged to pay a visit to the Schreckhorn on the following day. He was not well, and wisely stayed at home; I was not well, and unwisely went. The day was burning hot, and the stretch of glacier from the Grimsel to the Strahleck very trying. We, however, gained the summit of the pass, and from it scanned the peak which F. wished to assail. An adjacent peak had been surmounted by M. Desor and some friends, at the time of Agassiz's observations on the Lower Aar glacier, but the

summit they attained was about eighty feet below the true one, and to pass from one to the other they found impossible. We concluded that the ascent, though difficult, might be accomplished by spending the previous night upon the Strahleck.* I had my heart on other summits, and was unwilling to divert from them the time and trouble which the Schreckhorn would demand. Neither could I advise F. to try it, as his power among rocks like those of the Schreckhorn was still to be tested. The idea of climbing this pinnacle was therefore relinquished by us both.

On Saturday, accompanied by my friend and former fellow climber H., I ascended from Viesch to the Hotel Jungfrau on the slope of the Æggischhorn, and in the evening of the same day walked up to the summit of the mountain alone. As is usual with me, I wandered unconsciously from the beaten track, and had to make my way amid the chaos of crags which nature, in her ruinous moods, had shaken from the mountain. From these I escaped to a couloir, filled in part with loose *débris*, and down which the liberated boulders roll. My ascent was quick, and I soon found myself upon the crest of broken rocks which caps the mountain. This peak and those adjacent, which are similarly shattered, exhibit a striking picture of the ruin which nature inflicts upon her own creations. She buildeth up and taketh down. She lifts the mountains by her subterranean energies, and then blasts them

* It was actually accomplished from this side, a few days after my visit, by the Revd. Leslie Stephen.

by her lightnings and her frost. Thus grandly she rushes along the 'grooves of change' to her unattainable repose. Is it unattainable? The incessant tendency of material forces is toward final equilibrium; and if the quantity of this tendency be finite, a time of repose must come at last. If one portion of the universe be hotter than another, a flux instantly sets in to equalise the temperatures; while winds blow and rivers roll in search of a stable equilibrium. Matter longs for rest; when is this longing to be fully satisfied? If satisfied, what then? The state to which material nature tends is not one of perfection, but of death. Life is only compatible with mutation; and when the attractions and repulsions of material atoms have been satisfied to the uttermost, life ceases, and the world thenceforward is locked in everlasting sleep.

A wooden cross bleached by many storms surmounts the pinnacle of the Æggischhorn, and at the base of it I now take my place and scan the surrounding scene. Down from its birthplace in the mountains comes that noblest of ice-streams, the Great Aletsch glacier. Its arms are thrown round the shoulders of the Jungfrau, while from the Monk and the Trugberg, the Gletscherhorn, the Breithorn, the Aletschhorn, and many another noble pile, the tributary snows descend and thicken into ice. The mountains are well protected by their wintry coats, and hence the quantity of *débris* upon the glacier is comparatively small; still, along it we notice dark longitudinal streaks, which occupy the position the moraines would assume had matter sufficient to form them been cast down. Right

and left from these longitudinal bands finer curves sweep across the glacier, twisted here and there into complex windings. They mark the direction in which the subjacent ice is laminated. The glacier lies in a curved valley, the side towards which its convex curvature is turned, is thrown into a state of strain, the ice breaks across the line of tension, and a curious system of oblique glacier ravines is thus produced. From the snow line which crosses the glacier above the Faulberg a pure snow-field stretches upward to the Col de la Jungfrau; the Col which unites the maiden to her sacerdotal neighbour. Skies and summits are to-day without a cloud, and no mist or turbidity interferes with the sharpness of the outlines. Jungfrau, Monk, Eiger, Trugberg, cliffy Strahlgrat, stately, lady-like Aletschhorn, all grandly pierce the empyrean. Like a Saul of mountains the Finsteraarhorn overtops all his neighbours; then we have the Oberaarhorn, with the riven glacier of Viesch rolling from his shoulders. Below is the Mârjelin See, with its crystal precipices and its floating icebergs, snowy white, sailing on a blue green sea. Beyond is the range which divides the Valais from Italy. Sweeping round, the vision meets an aggregate of peaks which look, as fledglings to their mother, towards the mighty Dom. Then come the repellant crags of Mont Cervin; the idea of moral savagery, of wild untameable ferocity, mingling involuntarily with our contemplation of the gloomy pile. Next comes an object, scarcely less grand, conveying it may be even a deeper impression of majesty and might, than

the Matterhorn itself,—the Weisshorn, perhaps the most splendid object in the Alps. But beauty is associated with its force, and we think of it, not as cruel, but as grand and strong. Further to the right the Great Combin lifts up his bare head; other peaks crowd around him; while at the extremity of the curve round which our gaze has swept rises the sovran crown of Mont Blanc. And now, as the day sinks, scrolls of pearly clouds draw themselves around the mountain crests, being wafted from them into the distant air. They are without colour of any kind; still, by grace of form, and as the embodiment of lustrous light and most tender shade, their beauty is not to be described.

CHAPTER IV.

THE BEL ALP

'Happy, I said, whose home is here;
Fair fortunes to the Mountaineer.'

UP to Tuesday the 13th I remained at the Æggischhorn, sauntering over the Alps, or watching dreamily the mutations of light and shade upon the mountains. On this day I accompanied a party of friends to the Mârjelin See, skirted the lake, struck in upon the glacier, and having heard much of the position and the comfort of a new hotel upon the Bel Alp, I resolved to descend the glacier and pay the place a visit. The Valais range had been already clouded before we quitted the hotel, still the sun rode unimpeded in the higher heavens. Vast vapour masses, however, continued to thrust themselves forth like arms into the upper air; spreading laterally, they became entangled with each other, and thus the mesh of cloud became more continuous and obscure. Having tried in vain to daunt an English maiden whom I led among the crevasses, I separated from my companions, who had merely made an excursion from the hotel, and my friend

T., Benen, and myself commenced the descent of the glacier. The clouds unlocked themselves, thunder rung and echoed amid the crags of the Strahlgrat, accompanied by a furious downpour of rain. We crouched for a time behind a parapet of ice until the rain seemed to lighten, when we emerged, and went swiftly down the glacier. Sometimes my guide was in advance among the icehills and ravines, sometimes myself, an accident now and then giving the one an advantage over the other. The rain again commencing, we escaped from the ice to the flanking hillside, and hid ourselves for a time under a ledge of rock; being finally washed out of our retreat by the rush of water.

The rain again lightens, and we are off. The glacier is here cut up into oblique valleys of ice, these being subdivided by sharp-edged crevasses. We advance swiftly along the ridges which divide vale from vale, but these finally abut against the mountain, and we are compelled to cross from ridge to ridge. T. follows Benen, and I trust to my own devices. Joyously we strike our axes into the crumbling crests, and make our way rapidly between the chasms. The sunshine gushes down upon us for a time, and partially dries our drenched clothes, after which the atmosphere again darkens. A storm is brewing, and we urge ourselves to a swifter pace. At some distance to our left, we observe upon the ice a group of persons, consisting of two men, a boy, and an old woman. They are engaged beside a crevasse, and a thrill of horror shoots through me, at the thought of a man being possibly

between its jaws. We quickly join them, and find an unfortunate cow firmly jammed between the frozen sides of the fissure, groaning most piteously, but wholly unable to move. The men had possessed themselves of a bad rope and a common hatchet, and were doing their utmost to rescue the animal; but their means were inadequate, and their efforts ill-directed. They had passed their rope under the animal's tail, hoping thereby to raise its heavy haunches from the chasm; of course the noose slipped along the tail and was utterly useless. 'Give the brute space, cut away the ice which presses the ribs, and *you* step upon that block which stops the chasm, and apply your shoulders to the creature's buttocks.' The ice splinters fly aloft, under the vigorous strokes of Benen. T. suggests that one rope should be passed round the horns, so as to enable all hands to join in the pull. This is done. 'Pass your rope between the animal's hind legs instead of under its tail.' This is also done. Benen has loosened the ice which held the ribs in bondage, and now like mariners heaving an anchor, we all join in a tug, timing our efforts by an appropriate exclamation. The brute moves, but extremely little; again the cry, and again the heave—she moves a little more. This is repeated several times till her fore-legs are extricated and she throws them forward on the ice. We now apply our efforts to her hinder parts, and succeed in placing the animal upon the glacier, panting and trembling in all her fibres. 'Fold your rope, Johann, and onward; the day is darkening, and we know not what glacier work is still

before us.' On we went. Hark once more, to the thunder, now preceded by vivid lightning gleams which flash into my eyes from the polished surface of my axe. Gleam follows gleam, and peal succeeds peal with terrific grandeur; and the loaded clouds send down from all their fringes dusky streamers of rain. These look like water-spouts, so dense is their texture. Furious as was the descending shower; hard as we were hit by the mixed pellets of ice and water, I scarcely ever enjoyed a scene more. Grandly the cloud-besom swept the mountains, their colossal outlines looming at intervals like over-powered Titans struggling against their doom.

We are now entangled in crevasses, the glacier is impracticable, and we are forced to retreat to its western shore. We pass along the lateral moraine: rough work it proved, and tried poor T. severely. The mountain slope to our left becomes partially clothed with pines, but such spectral trees! Down the glacier valley wild storms had rushed, stripping the trunks of their branches, and the branches of their leaves, and leaving the tree-wrecks behind, as if spirit-stricken and accursed. We pause and scan the glacier, and decide upon a place to cross it. Our home is in sight, perched upon the summit of the opposite mountain. On to the ice once more, and swiftly over the ridges towards our destination. We reach the opposite side, wet and thirsty, and face the steep slope of the mountain; slowly we ascend it, strike upon a beaten track, and pursuing it, finally reach the pleasant auberge at which our day's journey ends.

If you and I should be ever in the Alps together, I shall be your guide from the Æggischhorn to the Bel Alp. You shall choose yourself whether the passage is to be made along the glacier, as we made it, or along the grassy mountain side to the Rieder Alp, and thence across the glacier to our hotel. Here, if the weather smile upon us, we may halt for two or three days. From the hotel on the Æggischhorn slope an hour and a half's ascent is required to place the magnificent view from the summit of the Æggischhorn in your possession. But from the windows of the hotel upon the Bel Alp noble views are commanded, and you may sit upon the bilberry slopes adjacent, in the presence of some of the noblest of the Alps. And if you like wildness, I will take you down to the gorge in which the Aletsch glacier ends, and there chill you with fear. I went down to this gorge on the 14th, and shrunk from the edge of it at first. A pine-tree stood sheer over it; bending its trunk at a right angle near its root, it laid hold of a rock, and thus supported itself above the chasm. I stood upon the horizontal part of the tree, and, hugging its upright stem, looked down into the gorge. It required several minutes to chase away the timidity with which I hung over this savage ravine; and, as the wind blew more forcibly against me, I clung with more desperate energy to the tree. In this wild spot, and alone, I watched the dying fires of the day, until the latest glow had vanished from the mountains.

And if you like to climb for the sake of a wider horizon,

you shall have your wish at the Bel Alp. High above it towers a gray pinnacle called the Sparrenhorn, and two hours of moderate exertion will place you and me together upon that point. I went up there on the 15th. To the observer from the hotel the Sparrenhorn appears as an isolated peak; it forms, however, the lofty end of a narrow ridge, which is torn into ruins by the weather, flanking on the east the forsaken bed of a névé, and bounding on the west the Ober Aletsch glacier. In front of me was a rocky promontory like the Abschwung, right and left of which descended two streams of ice, which welded themselves to a common trunk. This glacier scene was perfectly unexpected and strikingly beautiful. Nowhere have I seen such perfect repose, nowhere more tender curves or finer structural lines, forming loops across the glacier. The stripes of the moraine bending along its surface contribute to its beauty, and its deep seclusion gives it a peculiar charm. It is a river so protected by its bounding mountains that no storm can ever reach it, and no billow disturb the perfect serenity of its rest. The sweep of the Aletsch glacier is also mighty as viewed from this point, and from no other could the Valais range seem more majestic. It is needless to say a word about the grandeur of the Dom, the Cervin, and the Weisshorn, all of which, and a great deal more, are commanded from this point of view. Surely you and I must clamber thither, and if your feet refuse their aid I will pass my strap around your waist and draw you to the top.

CHAPTER V.

REFLECTIONS

'The world was made in order,
And the atoms march in tune.'

THE aspects of nature are more varied and impressive in Alpine regions than elsewhere. The mountains themselves are permanent objects of grandeur. The effects of sunrise and sunset; the formation and distribution of clouds; the discharge of electricity, such as we witnessed a day or two ago; the precipitation of rain, hail, and snow; the creeping of glaciers and the rushing of rivers; the colouring of the atmosphere and its grosser action in the case of storms;—all these things tend to excite the feelings and to bewilder the mind. In this entanglement of phenomena it seems hopeless to seek for law or orderly connection. And before the thought of law dawned upon the human mind men naturally referred these inexplicable effects to personal agency. The savage saw in the fall of a cataract the leap of a spirit, and the echoed thunder-peal was to him the hammer-clang of an exasperated god. Propitiation of these terrible powers

was the consequence, and sacrifice was offered to the demons of earth and air.

But the effect of time appears to be to chasten the emotions and to modify the creations which depend upon them alone, by giving more and more predominance to the intellectual power of man. One by one natural phenomena were associated with their proximate causes; this process still continues, and the idea of direct personal volition mixing itself in the economy of nature is retreating more and more. Many of us fear this tendency; our faith and feelings are dear to us, and we look with suspicion and dislike on any philosophy which would deprive us of the relations in which we have been accustomed to believe, as tending directly to dry up the soul. Probably every change from ancient savagery to our present enlightenment excited, in a greater or less degree, a fear of this kind. But the fact is, that we have not at all determined whether the form under which they now appear in the world is necessary to the prosperity of faith and feeling. We may err in linking the imperishable with the transitory, and confound the living plant with the decaying pole to which it clings. My object, however, at present is not to argue, but to mark a tendency. We have ceased to propitiate the powers of Nature,—ceased even to pray for things in *manifest* contradiction to natural laws. In Protestant countries, at least, I think it is conceded that the age of miracles is past.

The general question of miracles is at present in able and accomplished hands; and were it not so, my polemical

acquirements are so limited, that I should not presume to enter upon a discussion of this subject on its entire merits. But there is one little outlying point, which attaches itself to the question of miracles, and on which a student of science may, without quitting the ground which strictly belongs to him, make a few observations. If I should err here, there are many religious men in this country quite competent to correct me; and did I not feel it to be needless, I should invite them to do so. I shall, as far as possible, shut out in my brief remarks the exercise of mere *opinion*, so that if I am wrong, my error may be immediately reduced to demonstration.

At the auberge near the foot of the Rhone glacier, I met in the summer of 1858, an athletic young priest, who, after he had accomplished a solid breakfast and a bottle of wine, informed me that he had come up to 'bless the mountains,' this being the annual custom of the place. Year by year the Highest was entreated to make such meteorological arrangements as should ensure food and shelter for the flocks and herds of the Valaisians. A diversion of the Rhone, or a deepening of the river's bed, would have been of incalculable benefit to the inhabitants of the valley at the time I mention. But the priest would have shrunk from the idea of asking the Omnipotent to open a new channel for the river, or to cause a portion of it to flow up the Mayenwand, over the Grimsel Pass, and down the vale of Oberhasli to Brientz. This he would have deemed *a miracle*, and he did not come to ask the Creator to perform miracles, but to do something which he manifestly thought lay quite

within the bounds of the natural and non-miraculous. A Protestant gentleman who was present at the time, smiled at this recital. He had no faith in the priest's blessing, still he deemed the prayer actually offered to be different in kind from a request to open a new river-cut, or to cause the water to flow up-hill.

In a similar manner we all smile at the poor Tyrolese priest, who, when he feared the bursting of a glacier, offered the sacrifice of the mass upon the ice as a means of averting the calamity. That poor man did not expect to convert the ice into adamant, or to strengthen its texture so as to enable it to withstand the pressure of the water; nor did he expect that his sacrifice would cause the stream to roll back upon its source and relieve him, by a miracle, of its presence. But beyond the boundaries of his knowledge lay a region where rain was generated he knew not how. He was not so presumptuous as to expect a miracle, but he firmly believed that in yonder cloud-land matters could be so arranged, without trespass on the miraculous, that the stream which threatened him and his flock should be caused to shrink within its proper bounds.

Both the priests fashioned that which they did not understand to their respective wants and wishes; the unintelligible is the domain of the imagination. A similar state of mind has been prevalent among mechanicians; many of whom, and some of them extremely skilful ones, were occupied a century ago with the question of a *perpetual motion*. They aimed at constructing a

machine which should execute work without the expenditure of power; and many of them went mad in the pursuit of this object. The faith in such a consummation, involving as it did immense personal interest to the inventor, was extremely exciting, and every attempt to destroy this faith was met by bitter resentment on the part of those who held it. Gradually, however, the pleasant dream dissolved, as men became more and more acquainted with the true functions of machinery. The hope of getting work out of mere mechanical combinations, without expending power, disappeared; but still there remained for the mechanical speculator a cloud-land denser than that which filled the imagination of the Tyrolese priest, and out of which he still hoped to evolve perpetual motion. There was the mystic store of chemic force, which nobody understood; there were heat and light, electricity and magnetism, all competent to produce mechanical motions.* Here, then, is the mine in which we must seek our gem. A modified and more refined form of the ancient faith revived; and, for aught I know, a remnant of sanguine designers may at the present moment be engaged on the problem which like-minded men in former years left unsolved.

And why should a perpetual motion, even under modern conditions, be impossible? The answer to this question is the statement of that great generalisation of modern science, which is known under the name

* See Helmholtz—'Wechselwirkung der Naturkräfte.'

of the *Conservation of Force.* This principle asserts that no power can make its appearance in Nature without an equivalent expenditure of some other form of power; that natural agents are so related to each other as to be mutually convertible, but that no new agency is created. Light runs into heat; heat into electricity; electricity into magnetism; magnetism into mechanical force; and mechanical force again into light and heat. The Proteus changes, but he is ever the same; and his changes in Nature, supposing no miracle to supervene, are the expression, not of spontaneity, but of *physical necessity.* One primal essence underlies all natural phenomena — and that is MOTION. Every aspect of Nature is a quality of motion. The atmosphere is such by its power of atomic motion. The glacier resolves itself to water, the water to transparent vapour, and the vapour to untransparent cloud, by changes of motion. The very hand which moves this pen involves in its mechanical oscillation over this page the destruction of an equivalent amount of motion of another kind. A perpetual motion, then, is deemed impossible, because it demands the creation of force, whereas the principle of Nature is, no creation but infinite conversion.

It is an old remark that the law which moulds a tear also rounds a planet. In the application of law in Nature the terms great and small are unknown. Thus the principle referred to teaches us that the south wind gliding over the crest of the Matterhorn is as firmly ruled as the earth in its orbital revolution round the sun; and that

the fall of its vapour into clouds is exactly as much a matter of necessity as the return of the seasons. The dispersion therefore of the slightest mist by the special volition of the Eternal, would be as much a miracle as the rolling of the Rhone up the precipices of the Mayenwand. It seems to me quite beyond the present power of science to demonstrate that the Tyrolese priest, or his colleague of the Rhone valley, asked for an impossibility in praying for good weather; but science *can* demonstrate the incompleteness of the knowledge of Nature which limited their prayers to this narrow ground; and she may lessen the number of instances in which we 'ask amiss,' by showing that we sometimes pray for the performance of a miracle when we do not intend it. She does assert, for example, that without a disturbance of natural law, quite as serious as the stoppage of an eclipse, or the rolling of the St. Lawrence up the Falls of Niagara, no act of humiliation, individual or national, could call one shower from heaven, or deflect towards us a single beam of the sun. Those therefore who believe that the miraculous is still active in nature, may, with perfect consistency, join in our periodic prayers for fair weather and for rain: while those who hold that the age of miracles is past, will refuse to join in such petitions. And they are more especially justified in this refusal by the fact that the latest conclusions of science are in perfect accordance with the doctrine of the Master himself, which manifestly was that the distribution of natural phenomena is not affected by moral or religious causes. 'He maketh His sun to rise on the

evil and on the good, and sendeth rain on the just and on the unjust.' Granting 'the power of Free Will in man,' so strongly claimed in his admirable essay by the last defender of the belief in miracles *, and assuming the efficacy of free prayer to produce changes in external nature, it necessarily follows that natural laws are more or less at the mercy of man's volition, and no conclusion founded on the assumed permanence of those laws would be worthy of confidence.

These considerations have been already practically acted upon by individual ministers of the Church of England; and it is one of the most cheering signs of the times to see such men coming forward to prepare the public mind for changes, which though inevitable, could hardly, without due preparation, be wrought without violence. Iron is strong; still, water in crystallising will shiver an iron envelope, and the more rigid the metal is, the worse for its safety. There are men of iron among us who would encompass human speculation by a rigid envelope, hoping thereby to chain the energy, but in reality dooming what they wish to preserve to more certain destruction. If we want an illustration of this we have only to look at modern Rome. In England, thanks to men of the stamp to which I have alluded, scope is gradually given to thought for changes of aggregation, and the envelope slowly alters its form in accordance with the necessities of the time.

* Professor Mansel.

CHAPTER VI.

ASCENT OF THE WEISSHORN

'In his own loom's garment drest,
By his proper bounty blest,
Fast abides this constant giver,
Pouring many a cheerful river,
To far eyes an aërial isle,
Unploughed, which finer spirits pile;
Which morn, and crimson evening, paint
For bard, for lover, and for saint;
The country's core,
Inspirer, prophet, evermore!'

ON Friday the 16th of August I rose at 4.30 A.M.; the eastern heaven was hot with the glow of the rising sun, and against the burning sky the mountain outlines were most impressively drawn. At 5.30 I bade good bye to the excellent little auberge, and engaging a porter to carry my knapsack, went straight down the mountain towards Briegg. Beyond the end of the present ice the land gives evidence of vast glacier operations. It is scooped into hollows and raised into mounds; long ridges, sharpening to edges at the top, indicating the stranded moraines of the ancient glacier. And these hollows, and these hills, over which the ice had passed, destroying every trace of

life which could possibly find a lodgment in them, were now clothed with the richest verdure. And not to vegetable life alone did they give support, for a million grylli chirruped in the grass. Rich, sapid meadows spread their emerald carpets in the sun; nut trees and fruit trees glimmered as the light fell upon their quivering leaves. Thus sanative nature healed the scars which she had herself inflicted. The road is very rough a part of the way to Briegg; let us trust that before your arrival it will be improved. I took the diligence to Visp, and engaged a porter immediately to Randa. I had sent Benen thither, on reaching the Bel Alp, to seek out a resting-place whence the Weisshorn might be assailed. On my arrival I learned that he had made the necessary reconnaissance, and entertained hopes of our being able to gain the top.

This noble mountain had been tried on various occasions and from different sides by brave and competent men, but had never been scaled; and from the entries in the travellers' books I might infer that formidable obstacles stood in the way of a successful ascent. The peak of the mountain is not visible at Randa, being far withdrawn behind the Alps. Beyond the Biezbach its ramparts consist of a craggy slope crowned above by three tiers of rocky strata. In front of the hotel is a mountain slope with pines clinging to its ledges, while stretching across the couloir of the Biezbach the divided ramparts are connected by battlements of ice. A quantity of débris which has been carried down the couloir spreads out in the shape of a fan at the bottom; near the edge of this

débris stands a group of dingy houses, and close alongside them our pathway up the mountain runs.

Previous to quitting Randa I had two pair of rugs sewed together so as to form two sacks. These and other coverlets intended for my men, together with our wine and provisions, were sent on in advance of us. At 1 P.M., on the 18th of August, we, that is Benen, Wenger, and myself, quitted the hotel, and were soon zigzagging among the pines of the opposite mountain. Wenger had been the guide of my friend F., and had shown himself so active and handy on the Strahleck, that I commissioned Benen to engage him. During the previous night I had been very unwell, but I hoped that the strength left me, if properly applied, and drained to the uttermost, would still enable me to keep up with my companions. As I climbed the slope I suffered from intense thirst, and we once halted beside a fillet of clear spring water to have a draught. It seemed powerless to quench the drought which beset me. We reached a châlet; milking time was at hand, at our request a smart young Senner caught up a pail, and soon returned with it full of delicious milk. It was poured into a small tub. With my two hands I seized the two ends of a diameter of this vessel, gave it the necessary inclination, and stooping down, with a concentration of purpose which I had rarely before exerted, I drew the milk into me. Thrice I returned to the attack before that insatiate thirst gave way. The effect was astonishing. The liquid appeared to lubricate every atom of my body, and its fragrance to permeate my brain. I felt a growth of strength

at once commence within me; all anxiety as to physical power with reference to the work in hand soon vanished, and before retiring to rest I was able to say to Benen, 'Go were thou wilt to-morrow, and I will follow thee.'

Two hours' additional climbing brought us to our bivouac. A ledge of rock jutted from the mountain side, and formed an overhanging roof. On removing the stones from beneath it, a space of comparatively dry clay was laid bare. This was to be my bed, and to soften it Wenger considerately stirred it up with his axe. The position was excellent, for lying upon my left side I commanded the whole range of Monte Rosa, from the Mischabel to the Breithorn. We were on the edge of an amphitheatre. Beyond the Schallenbach was the stately Mettelhorn. A row of eminent peaks swept round to the right, linked by lofty ridges of cliffs, thus forming the circus in which the Schallenberg glacier originated. They were, however, only a spur cast out from the vaster Weisshorn, the cone of which was not visible from our dormitory. I wished to examine it, and in company with Benen skirted the mountain for half an hour, until the whole colossal pyramid stood facing us. When I first looked at it my hopes sank, but both of us gathered confidence from a more lengthened gaze. The mountain is a pyramid with three faces, the intersections of which form three sharp edges or arêtes. The end of the eastern arête was nearest to us, and on it our attention was principally fixed. A couloir led up to it filled with snow, which Benen, after having examined it with the telescope, pronounced 'furchtbar steil.' This

slope was cut across by a bergschrund, which we also carefully examined, and finally, Benen decided on the route to be pursued next morning. A chastened hope was predominant in both our breasts as we returned to our shelter.

Water was our first necessity: it seemed everywhere, but there was none to drink. It was locked to solidity in the ice and snow. The sound of it came booming up from the Vispbach, as it broke into foam or rolled its boulders over its waterworn bed; and the swish of many a minor streamlet mingled with the muffled roar of the large one. Benen set out in search of the precious liquid, and after a long absence returned with a jug and panful. I had been particular in including tea in our list of provisions; but on opening the parcel we found it half green, and not to be indulged in at a moment when the main object of one's life was to get an hour's sleep. We rejected the tea and made coffee instead. At our evening meal the idea of toasting our cheese occurred to Wenger, who is a man rich in expedients of all kinds. He turned the section of a large cheese towards the flame of our pine fire; it fizzed and blistered and turned viscous, and the toasted surface being removed was consumed with relish by us all. Our meal being ended and our beds arranged, by the help of Benen, I introduced myself into my two sacks in succession, and placed a knapsack beneath my head for a pillow. The talk now ceased and sleep became the object of our devotions.

But the goddess flies most shyly where she is most intensely wooed, still I think she touched my eyes gently

once or twice during the night. The sunset had been unspeakably grand, steeping the zenith in violet, and flooding the base of the heavens with crimson light. Immediately opposite to us, on the other side of the valley of St. Nicholas, rose the Mischabel, with its two great peaks, the Grubenhorn and the Täschhorn, each barely under 15,000 feet in height. Next came the Alphubel, with its flattened crown of snow; then the Alleleinhorn and Rympfischhorn encased in glittering enamel; then the Cima di Jazzi; next the mass of Monte Rosa, with nothing competent to cast a shadow between it and the sun, and consequently flooded with light from bottom to top. The face of the Lyskamm turned towards us was for the most part shaded, but here and there its projecting portions jutted forth like redhot embers as the light fell upon them. The 'Twins' were most singularly illuminated; across the waist of each of them was drawn a black bar produced by the shadow of a corner of the Breithorn, while their white bases and whiter crowns were exposed to the sunlight. Over the rugged face of the Breithorn itself the light fell as if in splashes, igniting its glaciers and swathing its black crags in a layer of transparent red. The Mettelhorn was cold, so was the entire range over which the Weisshorn ruled as king, while the glaciers which they embraced lay grey and ghastly in the twilight shade.

The sun is going, but not yet gone; while up the arch of the opposite heavens, the moon, within one day of being full, is hastening to our aid. She finally appears exactly behind the peak of the Rympfischhorn: the cone of the

mountain being projected for a time as a triangle on the disc. Only for a moment, however; for the queenly orb sails aloft, clears the mountain, and bears splendidly away through the tinted sky. The motion was quite visible, and resembled that of a vast balloon. As the day approached its end the scene assumed the most sublime aspect. All the lower portions of the mountains were deeply shaded, while the loftiest peaks, ranged upon a semicircle, were fully exposed to the sinking sun. They seemed pyramids of solid fire, while here and there long stretches of crimson light drawn over the higher snow-fields linked the glorified summits together. An intensely illuminated geranium flower seems to swim in its own colour which apparently surrounds the petals like a layer, and defeats by its lustre any attempt of the eye to seize upon the sharp outline of the leaves. A similar effect was here observed upon the mountains; the glory did not seem to come from them alone, but seemed also effluent from the air around them. This gave them a certain buoyancy which suggested entire detachment from the earth. They swam in splendour, which intoxicated the soul, and I will not now repeat in my moments of soberness the extravagant analogies which then ran through my brain. As the evening advanced, the eastern heavens low down assumed a deep purple hue, above which, and blending with it by infinitesimal gradations, was a belt of red, and over this again zones of orange and violet. I walked round the corner of the mountain at sunset, and found the western sky glowing with a more transparent crimson than that

which overspread the east. The crown of the Weisshorn was embedded in this magnificent light. After sunset the purple of the east changed to a deep neutral tint, and against the faded red which spread above it, the sun-forsaken mountains laid their cold and ghastly heads. The ruddy colour vanished more and more; the stars strengthened in lustre, until finally the moon and they held undisputed possession of the blue grey sky.

I lay with my face turned towards the moon until it became so chilled that I was forced to protect it by a light handkerchief. The power of blinding the eyes is ascribed to the moonbeams, but the real mischief is that produced by radiation from the eyes into clear space, and the inflammation consequent upon the chill. As the cold increased I was fain to squeeze myself more and more underneath my ledge, so as to lessen the space of sky against which my body could radiate. Nothing could be more solemn than the night. Up from the valley came the low thunder of the Vispbach. Over the Dom flashed in succession the stars of Orion, until finally the entire constellation hung aloft. Higher up in heaven was the moon, and her rays as they fell upon the snow-fields and pyramids were sent back in silvery lustre by some, while others remained dull. These, as the orb sailed round, came duly in for their share of the glory. The Twins caught it at length and retained it long, shining with a pure spiritual radiance while the moon continued to ride above the hills.

I looked at my watch at 12 o'clock; and a second time

at 2 A. M. The moon was then just touching the crest of the Schallenberg, and we were threatened with the withdrawal of her light. This soon occurred. We rose at $2\frac{1}{4}$ A. M., consumed our coffee, and had to wait idly for the dawn. A faint illumination at length overspread the west, and with this promise of the coming day we quitted our bivouac at $3\frac{1}{2}$ A. M. No cloud was to be seen; as far as the weather was concerned we were sure to have fair play. We rounded the shingly shoulder of the mountain to the edge of a snow-field, but before entering upon it I disburthened myself of my strong shooting jacket, and left it on the mountain side. The sunbeams and my own exertion would, I knew, keep me only too warm during the day. We crossed the snow, cut our way through a piece of entangled glacier, reached the bergschrund, and passed it without a rope. We ascended the frozen snow of the couloir by steps, but soon diverged from it to the rocks at our right, and scaled them to the end of the eastern arête of the mountain.

Here a saddle of snow separates us from the next higher rocks. With our staff-spikes at one side of the saddle, we pass by steps cut upon the other. The snow is firmly congealed. We reach the rocks, which we find hewn into fantastic turrets and obelisks, while the loose chips of this colossal sculpture are strewn confusedly upon the ridge. Amid the chips we cautiously pick our way, winding round the towers or scaling them amain. From the very first the work is heavy, the bending, twisting, reaching, and drawing up, calling upon all the muscles of the frame.

After two hours of this work we halt, and looking back we observe two moving objects on the glacier below us. At first we take them to be chamois, but they are instantly pronounced men, and the telescope at once confirms this. The leader carries an axe, and his companion a knapsack and alpenstock. They are following our traces, losing them apparently now and then, and waiting to recover them. Our expedition had put Randa in a state of excitement, and some of its best climbers had come to Benen and urged him to take them with him. But this he did not deem necessary, and now here were two of them determined to try the thing on their own account; and perhaps to dispute with us the honour of the enterprise. On this point, however, our uneasiness was small.

Resuming our gymnastics, the rocky staircase led us to the flat summit of a tower, where we found ourselves cut off from a similar tower by a deep gap bitten into the mountain. Retreat appeared inevitable, but it is wonderful how many ways out of difficulty open to a man who diligently seeks them. The rope is here our refuge. Benen coils it round his waist, scrapes along the surface of the rock, fixes himself on a ledge, where he can lend me a helping hand. I follow him, Wenger follows me, and in a few minutes all three of us stand in the middle of the gap. By a kind of screw motion we twist ourselves round the opposite tower, and reach the arête behind it. Work of this kind, however, is not to be performed by the day, and with a view of sparing our strength, we quit the arête and endeavour to get along the southern slope of the

pyramid. The mountain is here scarred by longitudinal depressions which stretch a long way down it. These are now filled with clear hard ice, produced by the melting and refreezing of the snow. The cutting of steps across these couloirs proves to be so tedious and fatiguing, that I urge Benen to abandon it and try the arête once more. By a stout tug we regain the ridge and work along it as before. Here and there from the northern side the snow has folded itself over the crags, and along it we sometimes work upward. The arête for a time has become gradually narrower, and the precipices on each side more sheer. We reach the end of one of the subdivisions of the ridge, and find ourselves separated from the next rocks by a gap about twenty yards across. The arête here has narrowed to a mere wall, which, however, as rock would present no serious difficulty. But upon the wall of rock is placed a second wall of snow, which dwindles to a knife edge at the top. It is white and pure, of very fine grain, and a little moist. How to pass this snow catenary I knew not, for I had no idea of a human foot trusting itself upon so frail a support. Benen's practical sagacity was, however, greater than mine. He tried the snow by squeezing it with his foot, and to my astonishment commenced to cross. Even after the pressure of his feet the space he had to stand on did not exceed a handbreadth. I followed him, exactly as a boy walking along a horizontal pole, with toes turned outwards. Right and left the precipices were appalling; but the sense of power on such occasions is exceedingly sweet. We reached the opposite rock, and

here a smile rippled over Benen's countenance as he turned towards me. He knew that he had done a daring thing, though not a presumptuous one. 'Had the snow,' he said, 'been less perfect, I should not have thought of attempting it, but I knew after I had set my foot upon the ridge that we might pass without fear.'

It is quite surprising what a number of things the simple observation made by Faraday, in 1846, enables us to explain. Benen's instinctive act is justified by theory. The snow was fine in grain, pure and moist. When pressed, the attachments of its granules were innumerable, and their perfect cleanness enabled them to freeze together with a maximum energy. It was this freezing together of the particles at innumerable points which gave the mass its sustaining power. Take two fragments of ordinary table ice and bring them carefully together, you will find that they freeze and cement themselves at their place of junction; or if two pieces float in water, you can bring them together, when they instantly freeze, and by laying hold of either of them gently, you can drag the other after it through the water. Imagine such points of attachment distributed without number through a mass of snow. The substance becomes thereby a semi-solid instead of a mass of powder. My guide, however, unaided by any theory, did a thing from which I, though backed by all the theories in the world, should have shrunk in dismay.

After this we found the rocks on the ridge so shaken to pieces that it required the greatest caution to avoid bringing them down upon us. With all our care, however, we

sometimes dislodged vast masses which leaped upon the slope adjacent, loosened others by their shock, these again others, until finally a whole flight of them would escape, setting the mountain in a roar as they whizzed and thundered along its side to the snow-fields 4000 feet below us. The day is hot, the work hard, and our bodies are drained of their liquids as by a Turkish bath. The perspiration trickles down our faces, and drops profusely from the projecting points. To make good our loss we halt at intervals where the melted snow forms a liquid vein, and quench our thirst. We possess, moreover, a bottle of champagne, which, poured sparingly into our goblets on a little snow, furnishes Wenger and myself with many a refreshing draught. Benen fears his eyes, and will not touch champagne. The less, however, we rest the better, for after every pause I find a certain unwillingness to renew the toil. The muscles have become set, and some minutes are necessary to render them again elastic. But the discipline is first-rate for both mind and body. There is scarcely a position possible to a human being which, at one time or another during the day, I was not forced to assume. The fingers, wrist, and forearm, were my main reliance, and as a mechanical instrument the human hand appeared to me this day in a light which it never assumed before. It is a miracle of constructive art.

We were often during the day the victims of illusions regarding the distance which we had to climb. For the most part the summit was hidden from us, but on reaching the eminences it came frequently into view. After

three hours spent on the arête, about five hours that is, subsequent to starting, the summit was clearly in view; we looked at it over a minor summit, which gave it an illusive proximity. 'You have now good hopes,' I remarked, turning to Benen. 'Not only good hopes,' he replied, 'but I do not allow myself to entertain the idea of failure.' Well, six hours passed on the arête, each of which put in its inexorable claim to the due amount of mechanical work; the lowering and the raising of three human bodies through definite spaces, and at the end of this time we found ourselves apparently no nearer to the summit than when Benen's hopes cropped out in confidence. I looked anxiously at my guide as he fixed his weary eyes upon the distant peak. There was no confidence in the expression of his countenance; still I do not believe that either of us entertained for a moment the thought of giving in. Wenger complained of his lungs, and Benen counselled him several times to stop and let him and me continue the ascent; but this the Oberland man refused to do. At the commencement of a day's work I often find myself anxious, if not timid; but this feeling vanishes when I become warm and interested. When the work is very hard we become callous, and sometimes stupefied by the incessant knocking about. This was my case at present, and I kept watch lest my indifference should become carelessness. I supposed repeatedly a case where a sudden effort might be required of me, and felt all through that I had a fair residue of strength to fall back upon. I tested this conclusion sometimes by a spurt;

flinging myself suddenly from rock to rock, and thus proved my condition by experiment instead of relying on opinion. An eminence in the ridge which cut off the view of the summit was now the object of our exertions. We reached it; but how hopelessly distant did the summit appear! Benen laid his face upon his axe for a moment; a kind of sickly despair was in his eye as he turned to me, remarking, 'Lieber Herr, die Spitze ist noch sehr weit oben.'

Lest the desire to gratify me should urge him beyond the bounds of prudence, I said to Benen that he must not persist on my account, if he ceased to feel confidence in his own powers; that I should cheerfully return with him the moment he thought it no longer safe to proceed. He replied that though weary he felt quite sure of himself, and asked for some food. He had it, and a gulp of wine, which mightily refreshed him. Looking at the mountain with a firmer eye, he exclaimed, 'Herr! wir müssen ihn haben,' and his voice, as he spoke, rung like steel within my heart. I thought of Englishmen in battle, of the qualities which had made them famous, it was mainly the quality of not knowing when to yield; of fighting for duty even after they had ceased to be animated by hope. Such thoughts had a dynamic value, and helped to lift me over the rocks. Another eminence now fronted us, behind which, how far we knew not, the summit lay. We scaled this height, and above us, but clearly within reach, a silvery pyramid projected itself against the blue sky. I was assured ten times by my companions that it

was the highest point before I ventured to stake my faith upon the assertion. I feared that it also might take rank with the illusions which had so often beset our ascent, and shrunk from the consequent moral shock. Towards the point, however, we steadily worked. A large prism of granite, or granitic gneiss, terminated the arête, and from it a knife edge of pure white snow ran up to a little point. We passed along the edge, reached that point, and instantly swept with our eyes the whole range of the horizon. The crown of the Weisshorn was underneath our feet.

The long pent feelings of my two guides found vent in a wild and reiterated cheer. Benen shook his arms in the air and shouted as a Valaisian, while Wenger chimed in with the shriller yell of the Oberland. We looked along the arête, and far below perched on one of its crags, could discern the two Randa men. Again and again the roar of triumph was sent down to them. They had accomplished but a small portion of the ridge, and soon after our success they wended their way homewards. They came, willing enough, no doubt, to publish our failure had we failed; but we found out afterwards that they had been equally strenuous in announcing our success; they had seen us they affirmed like three flies upon the summit of the mountain. Both men had to endure a little persecution for the truth's sake, for nobody in Randa would believe that the Weisshorn could be scaled, and least of all by a man who for two days previously had been the object of Philomène, the waiter's, constant pity, on account of the incompetence of his stomach to accept

all that she offered for its acceptance. The energy of conviction with which the men gave their evidence had, however, convinced the most sceptical before we arrived ourselves.

Benen wished to leave some outward and visible sign of our success on the summit. He deplored having no flag; but as a substitute it was proposed that he should knock the head off his axe, use the handle as a flagstaff, and surmount it by a red pocket-handkerchief. This was done, and for some time subsequently the extempore banner was seen flapping in the wind. To his extreme delight, it was shown to Benen himself three days afterwards by my friend Mr. Galton from the Riffel hotel. But you will desire to know what we saw from the summit, and this desire I am sorry to confess my total incompetence to gratify. I remember the picture, but cannot analyse its parts. Every Swiss tourist is acquainted with the Weisshorn. I have long regarded it as the noblest of all the Alps, and many, if not most other travellers, have shared this opinion. The impression it produces is in some measure due to the comparative isolation with which its cone juts into the heavens. It is not masked by other mountains, and all around the Alps its final pyramid is in view. Conversely the Weisshorn commands a vast range of prospect. Neither Benen nor myself had ever seen anything at all equal to it. The day, moreover, was perfect; not a cloud was to be seen; and the gauzy haze of the distant air, though sufficient to soften the outlines and enhance the colouring of the moun-

tains, was far too thin to obscure them. Over the peaks and through the valleys the sunbeams poured, unimpeded save by the mountains themselves, which in some cases drew their shadows in straight bars of darkness through the illuminated air. I had never before witnessed a scene which affected me like this. Benen once volunteered some information regarding its details, but I was unable to hear him. An influence seemed to proceed from it direct to the soul; the delight and exultation experienced were not those of Reason or of Knowledge, but of BEING:—I was part of it and it of me, and in the transcendent glory of Nature I entirely forgot myself as man. Suppose the sea waves exalted to nearly a thousand times their normal height, crest them with foam, and fancy yourself upon the most commanding crest, with the sunlight from a deep blue heaven illuminating such a scene, and you will have some idea of the form under which the Alps present themselves from the summit of the Weisshorn. East, west, north, and south, rose those 'billows of a granite sea,' back to the distant heaven, which they hacked into an indented shore. I opened my note-book to make a few observations, but I soon relinquished the attempt. There was something incongruous, if not profane, in allowing the scientific faculty to interfere where silent worship was the 'reasonable service.'

CHAPTER VII.

THE DESCENT

'He clasps the crag with hooked hands.'

WE had been ten hours climbing from our bivouac to the summit, and it was now necessary that we should clear the mountain before the close of day. Our muscles were loose and numbed, and unless extremely urged declined all energetic tension: the thought of our success, however, ran like a kind of wine through our fibres and helped us down. We once fancied that the descent would be rapid, but it was far from it. Benen, as in ascending, took the lead; he slowly cleared each crag, paused till I joined him, I pausing till Wenger joined me, and thus one or other of us was always in motion. Benen shows a preference for the snow where he can choose it, while I hold on to the rocks where my hands can assist my feet. Our muscles are sorely tried by the twisting round the splintered turrets of the arête, and we resolve to escape from it when we can; but a long, long stretch of the ridge must be passed before we dare to swerve from it. We are roused

from our stupefaction at times by the roar of the stones which we have loosed from the ridge, and sent leaping down the mountain. The snow catenary is attained, and we recross it. Soon afterwards we quit the ridge and try to get obliquely along the slope of the mountain. The face of the pyramid is here scarred by couloirs, of which the deeper and narrower ones are filled with ice, while the others are highways to the bottom of the mountain for the rocks quarried by the weather above. Steps must be cut in the ice, but the swing of the axe is very different now from what it was in the morning. Still, though Benen's blows descend with the deliberateness of a man whose fire is half-quenched, they fall with sufficient power, and the needful cavities are soon formed. We retrace our morning steps over some of the slopes. No word of warning was uttered here as we ascended, but now Benen's admonitions were frequent and emphatic,—'Take care not to slip.' I looked down the slopes; they seemed fearfully long, and those whose ends we could see were continued by rocks over which it would be the reverse of comfortable to be precipitated. I imagined, however, that even if a man slipped he would be able to arrest his descent; but Benen's response when I stated this opinion was very prompt,—'No! it would be utterly impossible. If it were snow you might do it, but it is pure ice, and if you fall you will lose your senses before you can use your axe.' I suppose he was right. At length we turn directly downwards, and work along one of the ridges which are

here drawn parallel to the line of steepest fall. We first drop cautiously from ledge to ledge. At one place Benen clings for a considerable time to a face of rock, casting out feelers of leg and arm, and desiring me to stand still. I do not understand the difficulty, for the rock though steep is by no means vertical. I fasten myself to it, but Benen is now on a ledge below, waiting to receive me. The spot on which he stands is a little rounded protuberance sufficient to afford him footing, but over which the slightest momentum would have carried him. He knew this, and hence his caution in descending. Soon after this we quit our ridge and drop into a couloir to the left of it. It is dark and damp with trickling water. The rope hampers us, and I propose its abandonment. We disencumber ourselves, and find our speed greatly increased. In some places the rocks are worn to a powder, along which we shoot by glissades. We swerve again to the left; cross a ridge, and get into another and dryer couloir. The last one was dangerous, as the water exerted a constant sapping action upon the rocks. From our new position we could hear the clatter of stones descending the gully which we had just forsaken. Wenger, who had brought up the rear during the day, is now sent to the front; he has not Benen's power, but his legs are long and his descent rapid. He scents out the way, which becomes more and more difficult. He pauses, observes, dodges, but finally comes to a dead stop on the summit of a precipice, which sweeps like a rampart round the moun-

tain. We move to the left, and after a long détour succeed in rounding the rocky wall. Again straight downwards. Half an hour brings us to the brow of a second precipice, which is scooped out along its centre so as to cause the brow to overhang. I see chagrin in Benen's face: he turns his eyes upwards, and I fear mortally that he is about to propose a re-ascent to the arête. He had actually thought of doing so, but it was very questionable whether our muscles could have responded to such a demand. While we stood pondering here, a deep and confused roar attracted our attention. From a point near the summit of the Weisshorn, a rock had been discharged; it plunged down a dry couloir, raising a cloud of dust at each bump against the mountain. A hundred similar ones were immediately in motion, while the spaces between the larger masses were filled by an innumerable flight of smaller stones. Each of them shakes its quantum of dust in the air, until finally the avalanche is enveloped in a vast cloud. The clatter of this devil's cavalry was stunning. Black masses of rock emerged here and there from the cloud, and sped through the air like flying fiends. Their motion was not one of translation merely, but they whizzed and vibrated in their flight as if urged by wings. The clang of echoes resounded from side to side, from the Schallenberg to the Weisshorn and back, until finally the whole troop came to rest, after many a deep-sounding thud in the snow, at the bottom of the mountain. This stone avalanche was one of the most extraordinary things I had ever witnessed, and in connection

with it, I would draw the attention of future climbers to the danger which would infallibly beset any attempt to ascend the Weisshorn from this side, except by one of its arêtes. At any moment the mountain side may be raked by a fire as deadly as that of cannon.

After due deliberation we move along the precipice westward, I fearing that each step forward is but plunging us into deeper difficulty. At one place, however, the precipice bevels off to a steep incline of smooth rock. Along this runs a crack, wide enough to admit the fingers, and sloping obliquely down to the lower glacier. Each in succession grips the rock and shifts his body sideways parallel to the fissure, until he comes near enough to the glacier to let go and slide down by a rough glissade. We afterwards pass swiftly along the glacier, sometimes running, and, on the steeper slopes, by sliding, until we are pulled up for the third time by a precipice which seems actually worse than either of the others. It is quite sheer, and as far as I can see right or left altogether hopeless. I fully expected to hear Benen sound a retreat, but to my surprise both men turned without hesitation to the right, which took us away from our side of the mountain. I felt desperately blank, but I could notice no expression of dismay in the countenance of either of the men. They observed the moraine matter over which we walked, and at length one of them exclaimed, 'Da sind die Spuren,' lengthening his strides at the same moment. We look over the brink at intervals, and at length discover what appears to be

a mere streak of clay on the face of the precipice. We get round a corner, and find footing on this streak. It is by no means easy, but to hard-pushed men it is a deliverance. The streak vanishes, and we must scrape down the rock. This fortunately is rough, so that by pressing the hands against its rounded protuberances, and sticking the boot-nails against its projecting crystals we let our bodies gradually down. We thus reach the bottom; a deep cleft separates the glacier from the precipice, this is crossed, and we are now free men, clearly placed beyond the last bastion of the mountain.

I could not repress an expression of admiration at the behaviour of my men. The day previous to my arrival at Randa they had been up to examine the mountain, when they observed a solitary chamois moving along the base of this very precipice, and making several ineffectual attempts to get up it. At one place the creature succeeded; this spot they marked in their memories as well as they could, and when they reached the top of the precipice they sought for the traces of the chamois, found them, and were guided by them to the only place where escape in any reasonable time was possible. Our way is now clear; over the glacier we cheerfully march, and pass from the ice just as the moon and the eastern sky contribute about equally to the illumination. Wenger makes direct for our resting-place and packs up our things, while Benen and myself try to descend towards the châlet. Clouds gather round the Rympfischhorn and intercept the light of the moon. We

are often at a loss, and wander half-bewildered over the Alp. At length the welcome tinkle of cowbells is heard in the distance, and guided by them we reach the châlet a little after 9 P.M. The cows had been milked and the milk disposed of, but the men managed to get us a moderate draught. Thus refreshed we continue the descent, and are soon amid the pines which clothe the mountain facing Randa. A light glimmers from the window of the hotel; we conclude that they are waiting for us; it disappears, and we infer that they have gone to bed. Wenger is sent on to order some food; I was half-famished, for my nutriment during the day consisted solely of a box of meat lozenges given to me by Mr. Hawkins. Benen and myself descend the mountain deliberately, and after many windings emerge upon the valley, cross it, and reach the hotel a little before 11 P.M. I had a basin of broth, *not* made according to Liebig, and a piece of mutton boiled probably for the seventh time. Fortified by these, and comforted by a warm footbath, I went to bed, where six hours' sound sleep chased away every memory of the Weisshorn save the pleasant ones. I was astonished to find the loose atoms of my body knitted so firmly together by so brief a rest. Up to my attempt upon the Weisshorn I had felt more or less dilapidated, but here all weakness ended. My fibres assumed more and more the tenacity of steel, and during my subsequent stay in Switzerland I was unacquainted with infirmity. If you, my friend, should ask me why I incur such labour and such risk, here is *one* reply.

The height of the Weisshorn is fourteen thousand eight hundred and thirteen feet. Height, however, is but one element in the difficulty of a mountain. Monte Rosa, for example, is higher than the Weisshorn, but the difficulty of the former is small in comparison to that of the latter.

CHAPTER VIII.

THE MOTION OF GLACIERS

'The god that made New Hampshire,
Taunted the lofty land
With little men.'

IT is impossible for a man with his eyes open to climb a mountain like the Weisshorn without having his knowledge augmented in many ways. The mutations of the atmosphere, the blue zenith and the glowing horizon; rocks, snow, and ice; the wondrous mountain world into which he looks, and which refuses to be encompassed by a narrow brain: — these are objects at once poetic and scientific, and of such plasticity that every human soul can fashion them according to its own needs. It is not my object to dwell on these things at present, but I made one little observation in descending the Weisshorn to which I should like, in a more or less roundabout way, to direct your attention.

The wintry clouds, as you know, drop spangles on the mountains. If the thing occurred once in a century, historians would chronicle and poets would sing of the event; but Nature, prodigal of beauty, rains down her hexagonal

ice-stars year by year, forming layers yards in thickness. The summer sun thaws and partially consolidates the mass. Each winter's fall is covered by that of the ensuing one, and thus the snow layer of every year has to sustain an annually augmented weight. It is more and more compacted by the pressure, and ends by being converted into the ice of a true glacier, which stretches its frozen tongue far down below the limits of perpetual snow.

The glaciers move, and through valleys they move like rivers. 'Between the Mer de Glace and a river,' writes Rendu, 'there is a resemblance so complete that it is impossible to find in the latter a circumstance which does not exist in the former.' A cork when cast upon a stream, near its centre, will move more quickly than when thrown near the sides, for the progress of the stream is retarded by its banks. And as you and your guide stood together on the solid waves of that Amazon of ice you were borne resistlessly along. You saw the boulders perched upon their frozen pedestals; these were the spoils of distant hills, quarried from summits far away, and floated to lower levels like timber logs upon the Rhone. As you advanced towards the centre you were carried down the valley with an ever-augmenting velocity. You felt it not — he felt it not — still you were borne down with a velocity which, if continued, would amount to 1000 feet a year.

And could you have cast a log into the solid mass and determined the velocity of its deeper portions, you would have learned that the ice-river, like the liquid one, is retarded by its bed; that the surface of the glacier

moves more quickly than the bottom. You remember also the shape of that other glacier, where you passed along an ice crest six inches wide, with chasms of unsounded depth right and left. You never trembled; but you once swayed, and the guide bruised your arm by the pressure of his fingers. I told you when informed of this, that the shape of the valley was to blame. My meaning was this: the valley formed a curve at the place, and you stood upon the convex side of the glacier. This side was moving more speedily than the opposite one, thereby tearing itself more fiercely asunder. Hence arose the chasms which you then encountered. At this place the eastern side of the glacier moved more quickly than the western one. Higher up, the valley bent in the opposite direction, and there the western side moved quickest. Thus, exactly as in the Ribble and the Aire, and the Wye and the Thames; the place of swiftest motion of the glacier shifted from side to side in obedience to the curvature of the valley.

To a Savoyard priest, who, I am happy to say, afterwards became a bishop, we are indebted for the first clear enunciation of the truth that a glacier moves as a river; an idea which, as you know, was subsequently maintained with energy and success by a distinguished countryman of our own. Rendu called the portion of the glacier with which you are acquainted, and which is confined between banks of mountains, 'the *flowing* glacier' (*Glacier d'écoulement*), associating with the term 'flowing,' the definite physical idea which belongs to it; and he called the basin, or the

plateau, in which the snows which fed the lower ice-stream were collected the '*reservoir*.' He assigned a true origin to the glacier, a true progress, and a true end; and yet you, acquainted as you are with Alpine literature, and warmly as you were interested in the discussions to which that literature has given birth; you, I say, had actually forgotten the existence of this bishop, and required time to persuade yourself of his merits, when his claims were introduced in your presence before a society of friends three years ago.

Some have blamed me, and some have praised me, for the part which I have acted towards this man's memory. In one distinguished, but not disinterested quarter, I have been charged with prejudice and littleness of spirit; to which charge I have nothing to reply. A peaceable man when thus assailed, will offer no resistance. But you, my friend, know how light a value I set on my scientific labours in the Alps. Indeed, I need them not. The glaciers and the mountains have an interest for me beyond their scientific ones. They have been to me well-springs of life and joy. They have given me royal pictures and memories which can never fade. They have made me feel in all my fibres the blessedness of perfect manhood, causing mind, and soul, and body, to work together with a harmony and strength unqualified by infirmity or ennui. They have raised my enjoyments to a higher level, and made my heart competent to cope even with yours in its love of Nature. This has been the bounty of the Alps to me. And it is sufficient. I should look less cheerily into the future did

I not hope to micrify, by nobler work, my episode upon the glaciers. On it I shall never found the slightest claim of my own; but I do claim the right, and shall ever exercise it, of doing my duty towards my neighbour, and of giving to forgotten merit its award. I have done no more. Let it be made clear that I have wronged any man by false accusation, and Zacchæus was not more prompt than I shall be to make restitution. We may have all erred more or less in connection with this question; but had a little more chivalry been imported into its treatment twenty years ago, these personal discussions would not now associate themselves with the glaciers of the Alps.

But the glaciers have a motion besides that which they owe to the *quasi* plasticity of their own masses. Ice is slippy; ice is fusible; and in dead winter water flows along the glacier's bed. In dead winter the under surface of the glacier is wearing away. The glacier slides bodily over its rocky bed. 'Prove this;' you have a right to retort. Well, here is one proof. You have heard me speak of the fluted rocks of the Grimsel; you have heard of the ancient glaciers of England, Scotland, Ireland, and Wales. Killarney, to which I have already referred, affords magnificent examples of ancient glacier action. No man with the slightest knowledge of the glacier operations of to-day could resist the conclusion, that the Black Valley of Killarney was once filled by a glacier fed by the snows from Magillicuddy's Reeks; that the 'Cannon Rock,' the 'Man of War,' the 'Giant's Coffin,' and other masses fantastically named, were moulded to

their present shapes by a glacier which once held possession of the hollow now filled by the 'Upper Lake.' No man can resist the evidence of glacier action on the flanks of Snowdon, and round about the slopes of Scawfell Pike and Great Gable. And what is the nature of the evidence which thus refuses to be gainsaid? Simply the scoring and polishing and fluting of the rocks to which I have so often referred. Although executed ages ago, they are as fresh and unmistakable as if they had been executed last year; and to leave such marks and tokens behind it, the glacier must have slidden over its bed.

Here, then, is one proof of glacier sliding which was urged many years ago, and I think it is satisfactory. But not only does the glacier act upon the rocks, but the rocks must of necessity act upon the under surface of the glacier; and could we inspect this, we should assuredly find proof of sliding. This proof exists, and I am unable to state it in clearer language than that employed in the following letter which I have already published.

'Many years ago Mr. William Hopkins of Cambridge, pointed to the state of the rocks over which glaciers had passed as conclusive evidence that these vast masses of ice move bodily along their beds. Those rocks are known to have their angles rasped off, and to be fluted and scarred by the ice which has passed over them. Such appearances, indeed, constitute the entire evidence of the former existence of glaciers in this and other countries, discussed in the writings of Venetz, Charpentier, Agassiz, Buckland, Darwin, Ramsay, and other eminent men.

'I have now to offer a proof of the sliding of the ice exactly complementary to the above. Suppose a glacier to be a plastic mass, which did not slide, and suppose such a glacier to be turned upside down, so as to expose its under surface; that surface would bear the impression of its bed, exactly as melted wax bears the impression of a seal. The protuberant rocks would make hollows of their own shape in the ice, and the depressions of the bed would be matched by protuberances of their own shape on the under surface of the glacier. But, suppose the mass to slide over its bed, these exact impressions would no longer exist; the protuberances of the bed would then form longitudinal furrows, while the depressions of the bed would produce longitudinal ridges. From the former state of things we might infer that the bottom of the glacier is stationary, while from the latter we should certainly infer that the whole mass slides over its bed.

'In descending from the summit of the Weisshorn on the 19th of August last I found, near the flanks of one of its glaciers, a portion of the ice completely roofing a hollow, over which it had been urged without being squeezed into it. A considerable area of the under surface of the glacier was thus exposed, and the ice of that surface was more finely fluted than ever I have observed rocks to be. Had the tool of a cabinet-maker passed over it, nothing more regular and beautiful could have been executed. Furrows and ridges ran side by side in the direction of the motion, and the deeper and larger ones were chased by finer lines, produced by the smaller and sharper asperities of the bed.

The ice was perfectly unweathered, and the white dust of the rocks over which it had passed, and which it had abraded in its passage, still clung to it. The fact of sliding has been hitherto inferred from the action of the glacier upon the rocks; the above observation leads to the same inference from the action of the rocks upon the glacier. As stated at the outset, it is the complementary proof that the glacier moves bodily over its bed.'

CHAPTER IX.

SUNRISE ON THE PINES

'The sunbeam gave me to the sight
The tree adorned the formless light.'

I MUST here mention a beautiful effect which I observed from Randa on the morning of the 18th of August. The valley of St. Nicholas runs nearly north and south, and the ridge which flanks it to the east is partially covered with pines; the trees on the summit of this ridge as you look at them from the valley being projected against the sky. What I saw was this: as the sun was about to rise I could trace upon the meadows in the valley the outline of the shadow of the ridge which concealed him, and I could walk along the valley so as to keep myself quite within the shadow of the mountain. Suppose me just immersed in the shadow: as I moved along, successive pine-trees on the top of the ridge were projected on that portion of the heavens where the sun was about to appear, and every one of them assumed in this position a perfect silvery brightness. It was most interesting to observe, as I walked up or down the valley, tree after tree losing its opacity and

suddenly robing itself in glory. Benen was at mass at the time, and I drew Wenger's attention to the effect. He had never observed it before. I never met a guide who had—a fact to be explained by the natural repugnance of the eyes to be turned towards a sky of dazzling brightness. Professor Necker was the first who described this effect, and I have copied his description in 'the Glaciers of the Alps.' The only difference between his observation and mine is, that whereas he saw the *stems* of the trees also silver bright, I saw them drawn in dark streaks through the lustrous branches. The cause of the phenomenon I take to be this: You have often noticed the bright illumination of the atmosphere immediately surrounding the sun; and how speedily the brightness diminishes as your eye departs from the sun's edge. This brightness is mainly caused by the sunlight falling on the aqueous particles in the air, aided by whatever dust may be suspended in the atmosphere. If instead of aqueous particles fine solid particles were strewn in the air, the intensity of the light reflected from them would be greater. Now the spiculæ of the pine, when the tree is projected against the heavens, close to the sun's rim are exactly in this condition; they are flooded by a gush of the intensest light, and reflect it from their smooth surfaces to the spectator. Every needle of the pine is thus burnished, appearing almost as bright as if it were cut out of the body of the sun himself. Thus the leaves and more slender branches shine with exceeding glory, while the surfaces of the thicker stems which are turned from the sun escape the

light, and are drawn as dark lines through the brightness. Their diameters, however, are diminished by the irradiation from each side of them. I have already spoken of the lustre of thistle-down, in my book upon the Alps, and two days after the observation at Randa, I saw from Zermatt innumerable fragments of the substance floating at sunset in the western heaven, not far from the base of the Matterhorn. They gleamed like fragments of the sun himself. The lustre of the trees, then, I assume to be due to the same cause as the brilliancy of the heavens close to the sun; the superior intensity of the former being due to the greater quantity of light reflected from the solid spiculæ.

CHAPTER X.

INSPECTION OF THE MATTERHORN

'By million changes skilled to tell
What in the Eternal standeth well,
And what obedient Nature can,
Is this colossal talisman.'

ON the afternoon of the 20th we quitted Randa, with a threatening sky overhead. The considerate Philomène compelled us to take an umbrella, which we soon found useful. The flood-gates of heaven were unlocked, while defended by our cotton canopy, Benen and myself walked arm in arm to Zermatt. I instantly found myself in the midst of a circle of pleasant friends, some of whom had just returned from a successful attempt upon the Lyskamm. On the 22nd quite a crowd of travellers crossed the Theodule Pass; and knowing that every corner of the hotel at Breuil would be taken up, I halted a day so as to allow the people to disperse. Breuil, as you know, commands a view of the south side of the Matterhorn; and it was now an object with me to discover, if possible, upon the true peak of this formidable mountain, some ledge or cranny, where three men might spend a night. The mountain may be accessible or inaccessible,

but one thing seems certain, that starting from Breuil, or even from the châlets above Breuil, the work of reaching the summit is too much for a single day. But could a shelter be found amid the wild battlements of the peak itself, which would enable one to attack the obelisk at day-dawn, the possibility of conquest was so far an open question as to tempt a trial. I therefore sent Benen on to reconnoitre, purposing myself to cross the Theodule alone on the following day.

On the afternoon of the 22nd, I walked up to the Riffel, sauntering slowly, leaning at times on the head of my axe, or sitting down upon the grassy knolls, as my mood prompted. I have spoken with due reverence of external nature, still the magnificence of this is not always a measure of the traveller's joy. The joy is a polar influence made up of two complementary parts, the outward object, and the inward harmony with that object. Thus, on the hackneyed track to the Riffel, it is possible to drink the deepest delight from the contemplation of the surrounding scene. It was dinner-hour at the hotel above—dinner-hour at the hotel below, and there seemed to be but a single traveller on the way between them. The Matterhorn was all bare, and my vision ranged with an indefinable longing from base to summit over its blackened crags. The air which filled the valleys of the Oberland, and swathed in mitigated density the highest peaks, was slightly aqueous, though transparent, the watery particles forming so many *points d'appui*, from which the sunbeams were scattered through surround-

ing space. The whole medium glowed as if with the red light of a distant furnace, and through it the outline of the mountains grandly loomed. The glow augmented as the sun sank, reached its maximum, paused, and then ran speedily down to a cold and colourless twilight.

Next morning at nine o'clock, with some scraps of information from the guides to help me on my way, I quitted the Riffel to cross the Theodule. I was soon followed by the domestic of the hotel; a very strong fellow, kept by M. Seiler as a guide up Monte Rosa. Benen had requested him to see me to the edge of the glacier, and he now joined me with this intention. He knew my designs upon the Matterhorn, and strongly deprecated them. 'Why attempt what is impossible?' he urged. 'What you have already accomplished ought to satisfy you, without putting your life in such certain peril. Only think, Herr, what will avail your ascent of the Weisshorn if you are smashed upon the Mont Cervin. Mein Herr!' he added with condensed emphasis, 'thun Sie es nicht.' The whole conversation was in fact a homily, the strong point of which was the utter uselessness of success on the one mountain if it were to be followed by annihilation on the other. We reached the ridge above the glacier, where handing him a trinkgeld, which I had to force on his acceptance, I bade him good bye, assuring him that I would submit in all things to Benen's opinion. He had the highest idea of Benen's wisdom, and hence the assurance sent him home comforted.

I was soon upon the ice, once more alone, as I delight

to be at times. You have sometimes blamed me for going alone, and the right to do so ought to be earned by long discipline. As a habit I deprecate it; but sparingly indulged in, it is a great luxury. There are no doubt moods when the mother is glad to get rid of her offspring, the wife of her husband, the lover of his mistress, and when it is not well to keep them together. And so, at rare intervals, it is good for the soul to feel the influence of that 'society where none intrudes.' When your work is clearly within your power, when long practice has enabled you to trust your own eye and judgment in unravelling crevasses, and your own axe and arm in subduing their more serious difficulties, it is an entirely new experience to be alone amid those sublime scenes. The peaks wear a more solemn aspect, the sun shines with a more effectual fire, the blue of heaven is more deep and awful, the air seems instinct with religion, and the hard heart of man is made as tender as a child's. In places where the danger is not too great, but where a certain amount of skill and energy are required, the feeling of self-reliance is inexpressibly sweet, and you contract a closer friendship with the universe in virtue of your more intimate contact with its parts. The glacier to-day filled the air with low murmurs, which the sound of the distant moulins raised to a kind of roar. The débris rustled on the moraines, the smaller rivulets babbled in their channels, as they ran to join their trunk, and the surface of the glacier creaked audibly as it yielded to the sun. It seemed to breathe and whisper like a living thing. To

my left was Monte Rosa and her royal court, to my right the mystic pinnacle of the Matterhorn, which from a certain point here upon the glacier attains its maximum sharpness. It drew my eyes towards it with irresistible fascination as it shimmered in the blue, too preoccupied with heaven, to think even with contempt on the designs of a son of earth to reach its inviolate crest.

Well, I crossed the Görner glacier quite as speedily as if I had been professionally led. Then up the undulating slope of the Theodule glacier with a rocky ridge to my right, over which I was informed a rude track led to the pass of St. Theodule. I am not great at finding tracks, and I missed this one, ascending until it became evident to me that I had gone too far. Near its higher extremity the crest of the ridge is cut across by three curious chasms, and one of these I thought would be a likely gateway through the ridge. I climbed the steep buttress of the spur and was soon in the fissure. Huge masses of rock were jammed into it, the presence of which gave variety to the exertion. I ascended along the angles between them and the cliffs to the left of them; the work was very pleasant, calling forth strength, but not exciting fear. From the summit the rocks sloped gently down to the snow, and in a few minutes the presence of broken bottles on the moraine showed me that I had hit upon the track over the pass. Upwards of twenty unhappy bees staggered against me on the way; tempted by the sun, or wafted by the wind, they had quitted the flowery Alps to meet torpor and death in the ice world above. From the

THE MATTERHORN.

summit I went swiftly down to Breuil, where I was welcomed by the host, welcomed by the waiter; loud were the expressions of content at my arrival; and I was informed that Benen had started early in the morning to 'promenade himself' around the Matterhorn.

I lay long upon the Alp, scanning crag and snow in search of my guide, and not doubting that his report would be favourable. You are already acquainted with the admirable account of our attempt on the Matterhorn drawn up by Mr. Hawkins, and from it you may infer that the ascent of this mountain is not likely to be a matter of mere amusement. The account tells you that after climbing for several hours in the face of novel difficulties, my friend thought it wise to halt so as to secure our retreat; for not one of us knew what difficulties the descent might reveal. I will here state in a few words what occurred after our separation. Benen and myself had first a hard scramble up some very steep rocks, our motions giving to those below us the impression that we were urging up bales of goods instead of the simple weight of our own bodies. Turning a corner of the ridge we had to cross a very unpleasant looking slope, the substratum of which was smooth rock, this being covered by about eighteen inches of snow. On ascending, this place was passed in silence, but in coming down the fear arose that the superficial layer might slip away with us; this would hand us over in the twinkling of an eye to the tender mercies of pure gravity for a thousand feet or more. Benen seldom warns me, but he did so here empha-

tically, declaring his own powerlessness to render any help should the footing give way. Having crossed this slope in our ascent we were fronted by a cliff, against which we rose mainly by aid of the felspar crystals protuberant from its face. Here is the grand difficulty of the Matterhorn; the rocks are sound, smooth, and steep, and hardly offer any grip to either hands or feet. Midway up the cliff referred to, Benen asked me to hold on, as he did not feel sure that it formed the best route. I accordingly ceased moving, and lay against the rock with legs and arms outstretched like a huge and helpless frog. Benen climbed to the top of the cliff, but returned immediately with a flush of confidence in his eye. 'I will lead you to the top,' he said excitedly. Had I been free I should have cried 'bravo!' but in my position I did not care to risk the muscular motion which a hearty bravo would demand. Aided by the rope I was at his side in a minute, and we soon learned that his confidence was premature. Difficulties thickened round us; on no other mountain are they so thick, and each of them is attended by possibilities of the most blood-chilling kind. Our mode of motion in such circumstances was this: — Benen advanced while I held on to a rock, prepared for the jerk if he should slip. When he had secured himself, he called out, 'Ich bin fest, kommen Sie.' I then worked forward, sometimes halting where he had halted, sometimes passing him until a firm anchorage was gained, when it again became his turn to advance. Thus each of us waited until the other could seize upon something

capable of bearing the shock of a sudden descent. At some places Benen deemed a little extra assurance necessary; and here he emphasised his statement that he was 'fest' by a suitable hyperbole. 'Ich bin fest wie ein Mauer, — fest wie ein Berg, ich halte Sie gewiss,' or some such expression. Looking from Breuil, a series of moderate sized prominences are seen along the arête of the Matterhorn; but when you are near them, these black eminences rise like tremendous castles in the air, so wild and high as almost to quell all hope of scaling or getting round them. At the base of one of these edifices Benen paused, and looked closely at the grand mass; he wiped his forehead, and turning to me said, 'Was denken Sie Herr?' — 'Shall we go on, or shall we retreat? I will do what you wish.' 'I am without a wish, Benen,' I replied: 'Where you go I follow, be it up or down.' He disliked the idea of giving in, and would willingly have thrown the onus of stopping upon me. We attacked the castle, and by a hard effort reached one of its mid ledges, whence we had plenty of room to examine the remainder. We might certainly have continued the ascent beyond this place, but Benen paused here. To a minute of talk succeeded a minute of silence, during which my guide earnestly scanned the heights. He then turned towards me, and the words seemed to fall from his lips through a resisting medium, as he said, 'Ich denke die Zeit ist zu kurtz,' — 'It is better to return.' By this time each of the neighbouring peaks had unfolded a cloud banner, remaining clear to windward, but having a

streamer hooked on to its summit and drawn far out into space by the moist south wind. It was a grand and affecting sight, grand intrinsically, but doubly impressive to feelings already loosened by the awe inseparable from our position. Looked at from Breuil, the mountain shows two summits separated from each other by a possibly impassable cleft. Only the lower one of these could be seen from our station. I asked Benen how high he supposed it to be above the point where we then stood; he estimated its height at 400 feet; I at 500 feet. Probably both of us were under the mark; however, I state the fact as it occurred. The object of my present visit to Breuil was to finish the piece of work thus abruptly broken off, and so I awaited Benen's return with anxious interest.

At dusk I saw him striding down the Alp, and went out to meet him. I sought to gather his opinion from his eye before he spoke, but could make nothing out. It was perfectly firm, but might mean either pro or con. 'Herr,' he said at length, in a tone of unusual emphasis, 'I have examined the mountain carefully, and find it more difficult and dangerous than I had imagined. There is no place upon it where we could well pass the night. We might do so on yonder Col upon the snow, but there we should be almost frozen to death, and totally unfit for the work of the next day. On the rocks there is no ledge or cranny which could give us proper harbourage; and starting from Breuil it is certainly impossible to reach the summit in a single day.' I was entirely taken aback by this report.

I felt like a man whose grip had given way, and who was dropping through the air. My thoughts and hopes had laid firm hold upon the Matterhorn, and here my support had suddenly broken off. Benen was evidently dead against any attempt upon the mountain. 'We can, at all events, reach the lower of the two summits,' I remarked. 'Even that is difficult,' he replied; 'but when you have reached it, what then? the peak has neither name nor fame.' I was silent; slightly irascible, perhaps; but it was against the law of my mind to utter a word of remonstrance or persuasion. Benen made his report with his eyes open. He knew me well, and I think mutual trust has rarely been more strongly developed between guide and traveller than between him and me. I knew that I had but to give the word and he would face the mountain with me next day, but it would have been inexcusable in me to deal thus with him. So I stroked my beard, and like Lelia in the 'Princess,' when

> 'Upon the sward
> She tapt her tiny silken-sandal'd foot,'

I crushed the grass with my hobnails, seeking thus a safety-valve for my disappointment.

My sleep was unsatisfying that night, and on the following morning I felt a void within. The hope that had filled my mind had been suddenly dislodged, and pure vacuity took its place. It was like the breaking down of a religion, or the removal of a pleasant drug to which one had been long accustomed. I hardly knew what to do with myself. One thing was certain—the Italian valleys

had no balm for my state of mind; the mountains alone could restore what I had lost. Over the Joch then once more! We packed up and bade farewell to the host and waiter. Both men seemed smitten with a sudden languor, and could hardly respond to my adieus. They had expected us to be their guests for some time, and were evidently disgusted at our want of pluck. 'Mais, monsieur, il faut faire la pénitence pour une nuit.' I longed for a moment to have the snub-nosed man half-way up the Matterhorn, with no arm but mine to help him down. Veils of the silkiest cloud began to draw themselves round the mountain, and to stretch in long gauzy filaments through the air, where they finally curdled up to common cloud, and lost the grace and beauty of their infancy. Had they condensed to thunder I should have been better satisfied; but it was some consolation to see them thicken so as to hide the mountain, and quench the longing with which I should have viewed its unclouded head. The thought of spending some days chamois hunting occurred to me. Benen seized the idea with delight, promising me an excellent gun. We crossed the summit, descended to Zermatt, paused there to refresh ourselves, and went forward to St. Nicholas, where we spent the night.

CHAPTER XI.

OVER THE MORO

'The splendour falls on rocky walls
And snowy summits old in story,
The long light shakes across the lakes,
And the wild cataract leaps in glory.'

BUT time is advancing, and I am growing old; over my left ear, and here and there amid my whiskers, the grey hairs are beginning to peep out. Some few years hence, when the stiffness which belongs to age has unfitted me for anything better, chamois hunting or the Scotch Highlands may suffice; but for the present let me breathe the air of the highest Alps. Thus I pondered on my pallet at St. Nicholas. I had only seen one half of Monte Rosa; and from the Italian side the aspect of the Mountain Queen was unknown to me. I had been upon the Monte Moro three years ago, but looked from it merely into an infinite sea of haze. To complete my knowledge of the mountain it was necessary to go to Macugnaga, and over the Moro I accordingly resolved to go. But resolution had as yet taken no deep root, and on reaching Saas I was beset by the desire to cross the Alphubel. Benen called

me at three; but over the pass grey clouds were swung, and as I was determined not to mar this fine excursion by choosing an imperfect day, I then gave it up. At seven o'clock, however, all trace of cloud had disappeared; it had been merely a local gathering of no importance, which the first sunbeams caused to vanish into air. It was now, however, too late to think of the Alphubel, so I reverted to my original design, and at 9 A.M. started up the valley towards Mattmark. A party of friends who were on the road before me contributed strongly to draw me on in this direction.

Onward then we went through the soft green meadows, with the river sounding to our right. The sun showered gold upon the pines, and brought richly out the colouring of the rocks. The blue wood smoke ascended from the hamlets, and the companionable grasshopper sang and chirruped right and left. High up the sides of the mountains the rocks were planed down to tablets by the ancient glaciers. The valley narrows, and we skirt a pile of moraine like matter, which is roped compactly together by the roots of the pines. Huge blocks here choke the channel of the river, and raise its murmurs to a roar. We emerge from shade into sunshine, and observe the smoke of a distant cataract jetting from the side of the mountain. Crags and boulders are here heaped in confusion upon the hill-side, and among them the hardy trees find a lodgment; asking no nutriment from the stones — asking only a pedestal on which they may plant their trunks and lift their branches into the nourishing air. Then comes the

cataract itself, plunging in rhythmic gushes down the shining rocks. Rhythm is the rule with Nature;—she abhors uniformity more than she does a vacuum. The passage of a resined bow across a string is typical of her operations. The heart beats by periods, and the messages of sense and motion run along the nerves in oscillations. A liquid cannot flow uniformly through an aperture, but runs by pulses which a little tact may render musical. A flame cannot pass up a funnel without bursting into an organ peal, and when small, as a jet of gas, its periodic flicker can produce a note as pure and sweet as any uttered by the nightingale. The sea waves are rhythmic; and the smaller ripples which form a chasing for the faces of the billows declare the necessity of the liquid to break its motion into periods. Nay, it may be doubted whether the planets themselves move through the space without an intermittent shiver as the ether rubs against their sides. Rhythm is the rule with Nature—

> 'She lays her beams in music,
> In music every one,
> To the cadence of the whirling world
> Which dances round the sun.'

The valley again opens, and finds room for a little hamlet, dingy hovels, with a white little church in the midst of them; patches of green meadow and yellow rye, with the gleam of the river here and there. The moon hangs over the Mischabelhörner, turning a face which ever waxes paler towards the sun. The valley in the distance seems shut in by the Allelein Glacier, towards which we work,

amid the waterworn boulders which the river in its hours of fury had here strewn around. The rounded rocks are now beautified with lichens, and scattered trees glimmer among the heaps. Nature heals herself. She feeds the glacier and planes the mountains down. She fuses the glacier and exposes the dead rocks. But instantly her energies are exerted to neutralize the desolation; clothing the crags with splendour, and setting the wind to melody as it wanders through the pines.

At the Mattmark hotel, which stands, as you perhaps know, at the foot of the Monte Moro, I was joined by a gentleman who had just liberated himself from an unpleasant guide. He was a novice in Switzerland, had been fleeced for a month by his conductor, and finally paid him a considerable sum to be delivered from his presence.* Benen halted on the way to adjust his knapsack, while my new companion and myself went on. We lost sight of my guide, lost the track also, and clambered over crag and snow to the summit, where we waited till Benen arrived. The mass of Monte Rosa here grandly revealed itself from top to bottom. Dark cliffs and white snows were finely contrasted, and the longer I looked at it, the more noble and impressive did the mountain appear. We were very soon clear of the snow, and went straight down the declivity towards Macugnaga. There are, or are to be, two hotels at the place, one of which belongs to Lochmatter,

* Every class of men has its scoundrels, and the Alpine guides come in for their share. It would be a great boon if some central authority existed, to which cases of real delinquency could be made known.

the guide. I looked at his house first, but I found a host of men hammering at the stones and rafters. It was still for the most part in a rudimentary state. A woman followed us as we receded, and sought to entice Benen back. Had she been clean and fair she might have succeeded, but she was dingy, and therefore failed. We put up at the Monte Moro, where a party of friends greeted me with a vociferous welcome. This was my first visit to Macugnaga, and save as a cauldron for the generation of fogs I knew scarcely anything about it. But there were no fogs there at the time to which I refer, and the place wore quite a charmed aspect. I walked out alone in the evening, up through the meadows towards the base of Monte Rosa, and on no other occasion have I seen peace, beauty and grandeur, so harmoniously blended. Earth and air were exquisite, and I returned to the hotel brimful of delight.

Monte Rosa with her peaks and spurs builds here a noble amphitheatre. From the heart of the mountain creeps the Macugnaga glacier. To the right a precipitous barrier extends to the Cima di Jazzi, and between the latter and Monte Rosa this barrier is scarred by two couloirs, one of which, or the cliff beside it, has the reputation of forming the old pass of the Weissthor. It had long been a myth whether this so-called 'Alter Pass' had ever been used as such, and many superior mountaineers deemed it from inspection to be impracticable. All doubt on this point was removed this year; for Mr. Tuckett, led by Benen, had crossed the barrier by the couloir most distant

from Monte Rosa, and consequently nearest to the Cima di Jazzi. It is a wonder that it had not been scaled by our climbers long ago, for the aspect of the place from Macugnaga is eminently calculated to excite the desire to attack it. As I stood in front of the hotel in the afternoon, I said to Benen that I should like to try the pass on the following day; in ten minutes afterwards, the plan of our expedition was arranged. We were to start before the dawn, and to leave Benen's hands free, a muscular young fellow, who had accompanied Mr. Tuckett, was engaged to carry our provisions. It was also proposed to vary the proceedings by assailing the ridge by the couloir nearest to Monte Rosa.

CHAPTER XII.

THE OLD WEISSTHOR

'He lifts me to the golden doors,
The flashes come and go;
All heaven bursts her starry floors,
And strows her light below.'

I WAS called by my host at a quarter before three. The firmament of Monte Rosa was almost as black as the rocks beneath it, while above in the darkness trembled the stars. At 4 A.M. we quitted the hotel; a bright half-moon was in the sky, and Orion hung out all his suns. We wound along the meadows, by the slumbering houses, and the unslumbering river. The eastern heaven soon brightened, and we could look direct through the gloom of the valley at the opening of the dawn. We threaded our way amid the boulders which the torrent had scattered over the plain, and among which groups of stately pines now find anchorage. Some of the trees had exerted all their force in a vertical direction, and rose straight, tall, and mastlike without lateral branches. We reached a great moraine, hoary with years, and clothed with magnificent pines; our way lay up it, and from the top we dropped into a

little dell of magical beauty. Deep hidden by the glacier-built ridges, guarded by noble trees, soft and green at the bottom, and tufted round with bilberry bushes, through which peeped here and there the lichen-covered crags; I have never seen a spot in which I should so like to dream away a day. Before I entered it, Monte Rosa was still in shadow, but I now noticed that in an incredibly short time all her precipices were in a glow. The purple colouring of the mountains encountered on looking down the valley was indescribable; out of Italy I have never seen anything like it. Oxygen and nitrogen could not produce the effect; some effluence from the earth, some foreign constituent of the atmosphere, developed in those deep valleys by the sun of the south, must sift the solar beams, abstracting a portion, and blending their red and violet to that incomparable hue. In the room where I work in London, there are three classes of actions on calorific rays: the first is due to the pure air itself, the oxygen and nitrogen whose mixture produces our atmosphere; this influence is represented in magnitude by the number 1. A second action is due to the aqueous vapour in the air, and this is represented by the number 40. A third action is due, to what I know not,—but its magnitude is represented by the number 20. As regards, therefore, its action upon radiant heat, the atmosphere of my room embraces a constituent, too minute to be laid hold of by any ordinary method of analysis, and which, nevertheless, is twenty times more potent than the air itself. We know not what we breathe. The air is filled with emanations which vary from day to day, and

mainly to such extraneous matters, are the chromatic splendours of our atmosphere to be ascribed. The air south of of the Alps is in this respect different from that on the north, but a modicum even of arsenic might be respired with satisfaction, if warmed by the bloom which suffused the air of Italy this glorious dawn.

The ancient moraines of the Macugnaga glacier rank among the finest that I have ever seen; long, high ridges tapering from base to edge, hoary with age, but beautified by the shrubs and blossoms of to-day. We crossed the ice and them. At the foot of the old Weissthor lay couched a small glacier, which had landed a multitude of boulders on the slope below it; and amid these we were soon threading our way. We crossed the little glacier which at one place strove to be disagreeable, and here I learned from the deportment of his axe the kind of work to which my porter had been previously accustomed. The head of the implement quitted its handle before half-a-dozen strokes had sounded on the ice. We reached the rocks to the right of our couloir and climbed them for some distance. The ice, in fact, at the base of the couloir was cut by profound fissures, which extended quite across, and rendered a direct advance up the gully impossible. At a proper place we dropped down upon the snow. Close along the rocks it was scarred by a furrow six or eight feet deep, and about twelve in width, evidently the track of avalanches, or of rocks let loose from the heights. Into this we descended. The bottom of the channel was firm and roughened by the stones which found a lodgment

there. I thought that we had here a suitable roadway up the couloir, but I had not time to convert the thought into a suggestion, before a crash occurred in the upper regions. I looked aloft, and right over the snow-brow which here closed the view, I perceived a large brown boulder in the air, while a roar of unseen stones showed that the visible projectile was merely the first shot of a general cannonade. They appeared,—pouring straight down upon us, —the sides of the couloir preventing them from squandering their force in any other direction. 'Schnell!' shouted the man behind me, and there is a ring in the word, when sharply uttered in the Alps, that almost lifts a man off his feet. I sprang forward, but urged by a sterner impulse, the man behind sprung right on to me. We cleared the furrow exactly as the first stone flew by, and once in safety we could calmly admire the wild energy with which the rattling boulders sped along.

Our way now lay up the couloir; the snow was steep but knobbly, and hence but few steps were required to give the boots a hold. We crossed and recrossed obliquely, like a laden horse drawing up hill. At times we paused and examined the heights; our couloir ended in the snow-fields above, but near the summit it suddenly rose in a high ice-wall. If we persisted in the couloir, this barrier would have to be surmounted, and the possibility of scaling it was very questionable. Our attention was therefore turned to the rocks at our right, and the thought of assailing them was several times mooted and discussed. They at length seduced us, and we resolved to abandon the couloir. To reach the

rocks, however, we had to recross the avalanche channel, which was here very deep. Benen hewed a gap at the top of its flanking wall, and stooping over, scooped steps out of the vertical face of indurated snow. He then made a deep hole in which he anchored his left arm, let himself thus partly down, and with his right pushed the steps to the bottom. While this was going on, small stones were continually flying down the gully. Benen reached the floor and I followed. Our companion was still clinging to the snow wall, when a horrible clatter was heard overhead. It was another stone avalanche, which there was hardly a hope of escaping. Happily a rock was here firmly stuck in the bed of the gully, and I chanced to be beside it when the first huge missile appeared. This was the delinquent which had set the others loose. I was directly in the line of fire, but ducking behind the boulder I let the projectile shoot over my head. Behind it came a shoal of smaller fry, each of them, however, quite competent to crack a human life. Benen shouted 'quick!' and never before had I seen his axe so promptly wielded. You must remember that while this infernal cannonade was being executed, we hung upon a slope of snow which had been pressed and polished to ice by the descending stones; and so steep that a single slip would have converted us into an avalanche also. Without steps of some kind we dared not set foot on the slope, and these had to be cut while the stone shower was in the act of falling on us. Mere scratches in the ice, however, were all the axe could accomplish, and on these we steadied ourselves with the energy

of desperate men. Benen was first, and I followed him, while the stones flew thick beside and between us. Once an ugly lump made right at me; I might perhaps have dodged it, but Benen saw it coming, turned, caught it on the handle of his axe as a cricketer catches a ball, and thus deflected it from me. The labour of his axe was here for a time divided between the projectiles and the ice, while at every pause in the volley, 'he cut a step and sprang forward.' Had the peril been less, it would have been amusing to see our contortions as we fenced with our swarming foes. A final jump landed us on an embankment, out of the direct line of fire which raked the gully, and we thus escaped a danger new in this form and extremely exciting to us all. We had next to descend an ice slope to the place at which the rocks were to be invaded. Andermatten slipped here, shot down the slope, knocked Benen off his legs, but before the rope had jerked me off mine, Benen had stopped his flight. The porter's hat, however, was shaken from his head and lost. Our work, as you will see, was not without peril, but if real discipline for eye, limb, head, and heart, be of any value, we had it here.

Behold us then fairly committed to the rocks; our first acquaintance with them was by no means comforting, — they were uniformly steep, and as far as we could judge from a long look upwards they were likely to continue so. A stiffer bit than ordinary interposed now and then, making us feel how possible it was to be entirely cut off. We at length reached real difficulty number one: all

three of us were huddled together on a narrow ledge, with a smooth and vertical cliff above us. Benen tried it in various ways while we held on to the rocks, but he was several times forced back to the ledge. At length he managed to get the fingers of one hand over the top of the cliff, while to aid his grip he tried to fasten his shoes against its face. But the nails scraped freely over the granular surface, and he had practically to lift himself by a single arm. As he did so he had the ugliest place beneath him over which a human body could well be suspended. We were tied to him of course; but the jerk, had his grip failed, would have been terrible. I am not given to heart-beat, but here my organ throbbed a little. By a great effort he raised his breast to a level with the top, and leaning over it he relieved the strain upon his arm. Supported thus he seized upon something further on, and lifted himself quite to the top. He then tightened the rope, and I slowly worked myself over the face of the cliff after him. We were soon side by side, while immediately afterwards Andermatten with his long unkempt hair, and face white with excitement, hung midway between heaven and earth supported by the rope alone. We hauled him up bodily, and as he stood upon our ledge, his limbs quivered beneath him.

We now strained slowly upwards amid the maze of crags, and scaled a second cliff resembling, though in a modified form, that just described. There was no peace, no rest, no delivery from the anxiety 'which weighed upon the heart.' Benen looked extremely

blank, and often cast an eye downward to the couloir, which we had quitted, muttering aloud, 'had we only stuck to the snow!' He had soon reason to emphasise his ejaculation. After climbing for some time, we reached a smooth vertical face of rock from which right or left, there was no escape, and over which we must go. Bennen first tried it unaided, but was obliged to recoil. Without a lift of five or six feet, the thing was impossible. When a boy I have often climbed a wall by placing a comrade in a stooping posture with his hands and head against the wall, getting on his back, and permitting him gradually to straighten himself till he became erect. This plan I now proposed to Benen, offering to take him on my back. 'Nein, Herr!' he replied; 'nicht Sie, ich well es mit Andermatten versuchen.' I could not persuade him, so Andermatten got upon the ledge, and fixed his knee for Benen to stand on. In this position my guide obtained a precarious grip, just sufficient to enable him to pass with safety from the knee to the shoulder. He paused here, and pulled away such splinters as might prove treacherous, if he laid hold of them. He at length found a firm one, and had next to urge himself, not fairly upward, for right above us the top was entirely out of reach, but obliquely along the face of the cliff. He succeeded, anchored himself, and called upon me to advance. The rope was tight, it is true, but it was not vertical, so that a slip would cause me to swing like a pendulum over the cliff's face. With considerable effort I managed to hand Benen his axe, and while doing so my own staff

escaped me and was irrecoverably lost. I ascended Andermatten's shoulders as Benen did, but my body was not long enough to bridge the way to Benen's arm; I had to risk the possibility of becoming a pendulum. A little protrusion gave my left foot some support. I raised myself a yard, and here was suddenly met by the iron grip of my guide. In a second I was safely stowed away in a neighbouring fissure. Andermatten now remained. He first detached himself from the rope, tied it round his coat and knapsack which were drawn up. The rope was again let down, and the porter tied it firmly round his waist, it tightened and lifted him tiptoe. It was not made in England, and was perhaps lighter than it ought to be; to help it hands and feet were scraped with spasmodic energy over the rock. He struggled too much, and Benen cried sharply, and apparently with some anxiety, 'Langsam! langsam! Keine Furcht!' The poor fellow looked very pale and bewildered as his bare head emerged above the ledge. His body soon followed. Benen always uses the imperfect for the present tense, 'Er war ganz bleich,' he remarks to me, the 'war,' meaning *ist.*

The young man seemed to regard Benen with a kind of awe. 'Mein Herr,' he exclaimed, 'you would not find another guide in Switzerland to lead you up here.' Nor, indeed, to Benen's credit be it spoken, would he have done so if he could have avoided it; but we had fairly got into a net, the meshes of which must be resolutely cut. I had previously entertained the undoubting belief that where a chamois could climb a man could follow; but when I saw

the marks of the animal on these all but inaccessible ledges, my belief, though not eradicated, became weaker than it had previously been. Onward again slowly winding through the craggy mazes, and closely scanning the cliffs as we ascended. Our easiest work was stiff, but the 'stiff' was an agreeable relaxation from the perilous. By a lateral deviation we reached a point whence we could look into the couloir by which Mr. Tuckett had ascended: here Benen relieved himself by a sigh and ejaculation: 'Would that we had chosen it, we might pass up yonder rocks blindfold!' But repining was useless, our work was marked out for us and must be accomplished. After another difficult tug Benen reached a point whence he could see a large extent of the rocks above us. There was no serious difficulty within view, and the announcement of this cheered us mightily. Every vertical yard, however, was to be won only by strenuous effort. For a long time the snow cornice hung high above us; we now approach its level; the last cliff forms a sloping stair with strata for steps. We spring up it, and the magnificent snowfield of the Görner glacier immediately opens to our view. The anxiety of the last four hours disappears like an unpleasant dream, and with that perfect happiness which perfect health can alone impart, we consumed our cold mutton and champagne on the summit of the old Wiessthor.

To the habits of the mountaineer Milton's opinion regarding the utility of teaching the use of weapons to his pupils is especially applicable. Such exercises constitute

'a good means of making them healthy, nimble, and well in breath, and of inspiring them with a gallant and fearless courage, which, being tempered with seasonable precepts of true fortitude and patience, shall turn into a native and heroic valour, and make them hate the cowardice of doing wrong.' Farewell!

THE END.

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